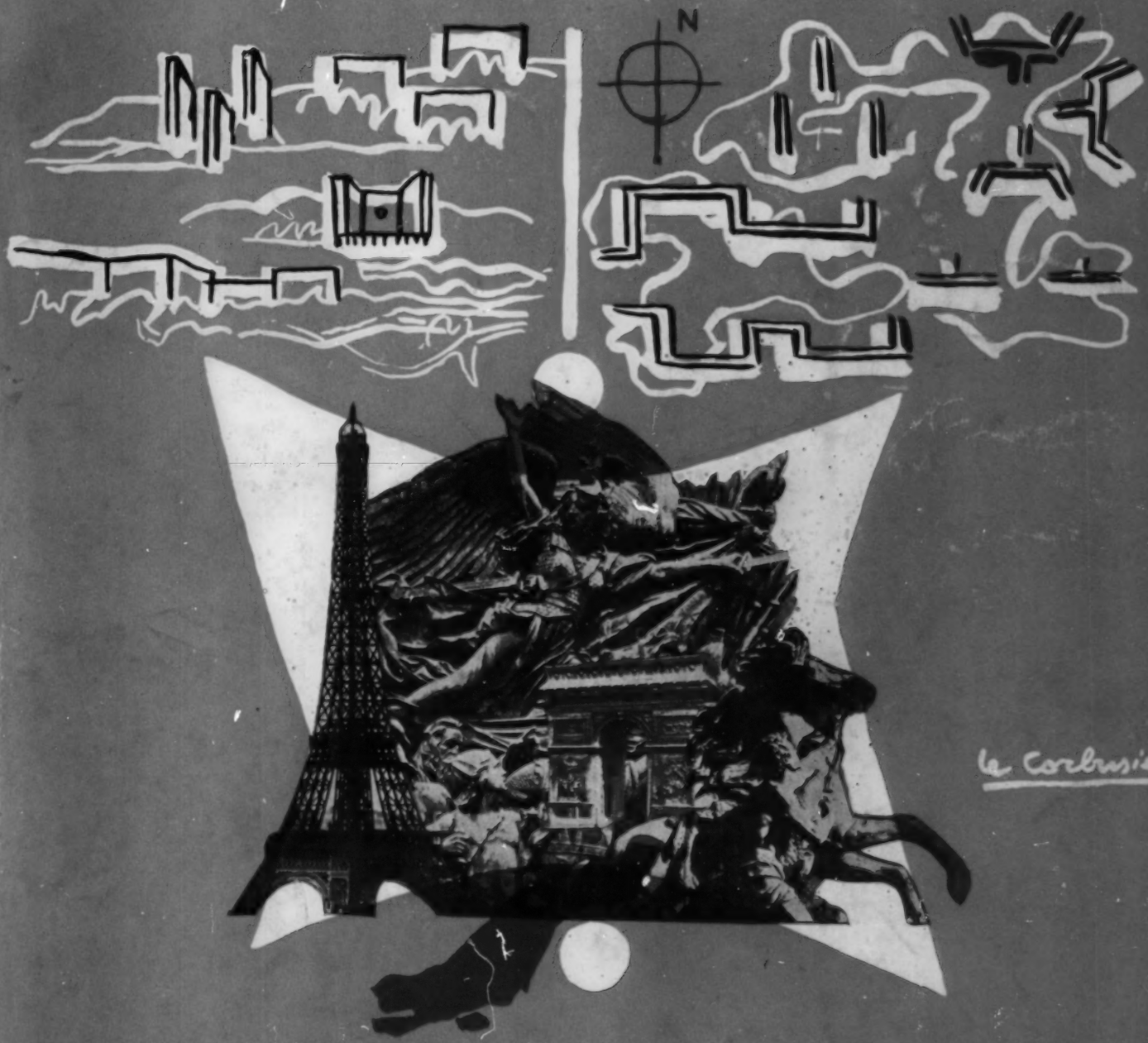
ARCHITECTURAL

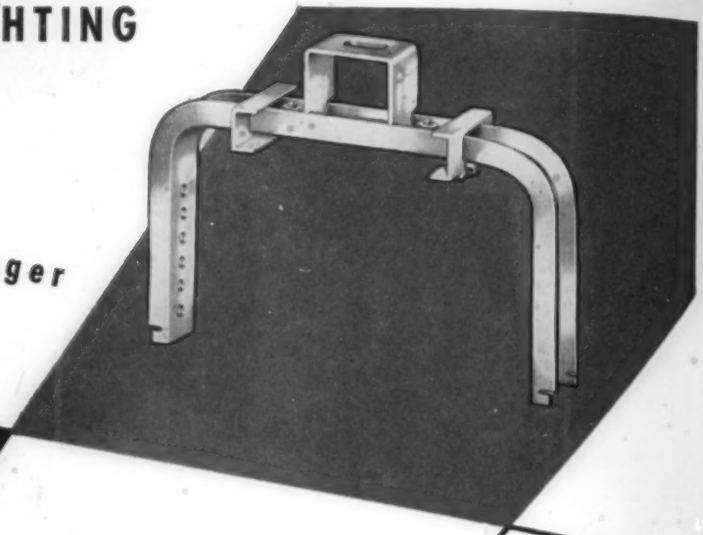
RECORD



MARCH 1946

for VERSATILITY in LIGHTING

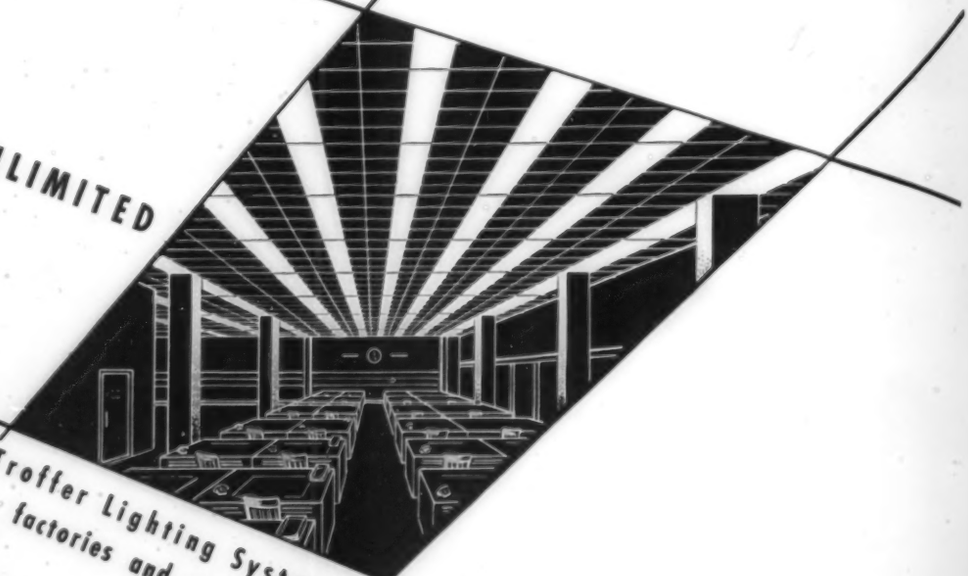
this Miller Hanger



easily installed

creates

CEILINGS UNLIMITED



Miller Fluorescent Troffer Lighting Systems for stores, offices, schools, factories and public buildings

THE MILLER COMPANY • MERIDEN, CONNECTICUT

ILLUMINATING DIVISION	ROLLING MILL DIVISION	FOUNDRY DIVISION	HEATING PRODUCTS DIVISION
Fluorescent, Incandescent Mercury Lighting Equipment	Phosphor Bronze and Brass in Sheets, Strips and Rolls	Non-Ferrous Metal Castings	Domestic Oil Burners and Liquid Fuel Devices

MILLER SINCE 1844

ARCHITECTURAL RECORD (Vol. 99, No. 3, March 1946) is published monthly by F. W. Dodge Corp., 10 Ferry Street, Concord, N. H., with editorial and executive offices at 119 W. 40th St., New York 18, N. Y. $3 per year; Foreign, $5.

Application for transfer of second class entry from the Post Office at East Stroudsburg, Pa., to Post Office at Concord, N. H., pending

2 drafting room techniques

that save time, labor, and dollars in the office!

Ever stop to think why a Draftsman *always* draws on translucent paper?

It's done so that reproductions can be made quickly in an Ozalid machine, or in blueprint or similar equipment.

In these units, light rays penetrate the original, exposing sensitized paper beneath. Then, the print is developed.

Opaque originals cannot be reproduced in this economical manner. They must be copied photographically—and, by comparison with OZALID's unique Dry-Development, this takes 65 times as long! And you receive only a negative—not a positive!

No wonder leading companies have changed to translucent forms . . . so that Ozalid could be utilized in all departments as well as in the Drafting Room!

1. Use translucent paper for office forms, reports, stationery.

Then, whenever you want reproductions, you can get POSITIVE OZALID PRINTS IN AS LITTLE AS 9 SECONDS!

Besides being the fastest technical reproduction process, OZALID IS THE MOST VERSATILE—allowing you to make 10 different types of prints; in different colors—black, blue, maroon, or sepia; and on different materials—paper, cloth, foil, or film.

Each type of OZALID PRINT has its advantages—you use the one best suited for the job at hand.

2. If originals are opaque, make a translucent "Master."

A positive film "MASTER" can be made from *any* opaque original in the usual photographic steps. This is used to turn out subsequent OZALID prints in seconds, at negligible cost. Then it can be filed away until more prints are needed.

Continuous-tone photographic material is reproduced this way. Also, advertising posters and direct mail folders prepared on opaque material.

See samples of the 10 types of OZALID PRINTS and learn the whole story. Write today for free booklet 46.

OZALID

DIVISION OF GENERAL ANILINE AND FILM CORPORATION
JOHNSON CITY, NEW YORK
Ozalid in Canada—Hughes Owens Co., Ltd., Montreal

Contractor Casey was stumped...

BUT NOT FOR LONG

He consulted with the architect and engineer...together they called in Ceco ...and the job went ahead on schedule

The job was a big one—the kind contractors like. It looked like smooth sailing to Casey until lack of materials suddenly stopped the job. But not Casey! With the architect, the engineer and Ceco, he made changes to use available Ceco products such as Concrete Reinforcing Bars, Meyer Steelforms, Welded Wire Fabric, Light Fabricated Trusses and Open Web Steel Joists, all of which gave greater advantages—in space and cost—in manpower and installation. The gist of it all is that Casey completed his contract on time, within the original cost, and to the satisfaction of the architect and owner.

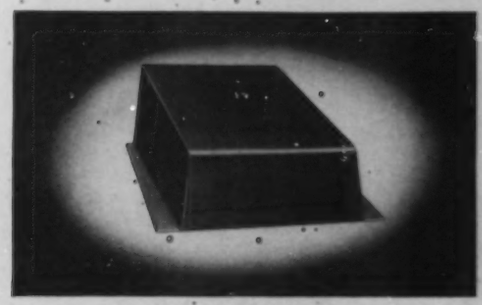
In construction products **CECO ENGINEERING**

CECO ENGINEERING PLUS CONSTRUCTION KNOW-HOW...MAY HELP YOU WITH YOUR PROBLEMS

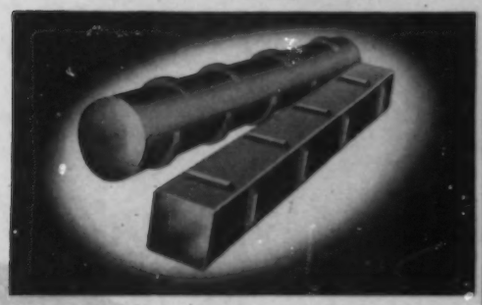
Ceco engineers do more than design fine construction products. All their wealth of technical engineering knowledge is constantly available to you, as well as their construction know-how gained by years of experience on the job in the field. In 23 offices strategically located from coast to coast, they stand ready to help solve your problems without delay, with perfect technical skill. Ceco Construction Products, whatever they are, are engineered so as to make for ease of installation and correct construction practice. So call on Ceco for engineering and construction skill, for the finest in construction products.

CECO STEEL PRODUCTS CORPORATION
MANUFACTURING DIVISION, 5675 WEST 26TH STREET, CHICAGO 50, ILLINOIS
Concrete Engineering Division, Merchant Trade Division, Highway Products Division
Offices, Warehouses and Fabricating Plants in Principal Cities

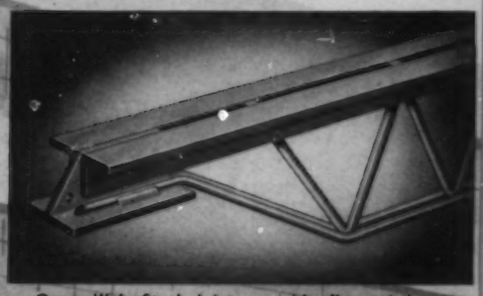
HERE ARE THE CECO PRODUCTS THAT HELPED SOLVE MR. CASEY'S PROBLEM:



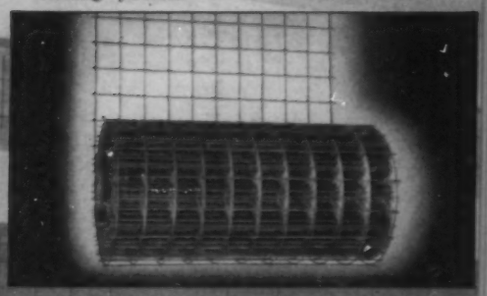
Meyer Steelforms mean less concrete is required, making for economy in construction.



Ceco Reinforcing Bars provide positive bond to aid adhesion of concrete to the steel.



Open Web Steel Joists provide fire-resistive construction, concealing sanitary, lighting and heating systems.



Ceco Welded Wire Fabric provides reinforcement for the concrete slab over Meyer Steelforms.

CECO STEEL PRODUCTS CORPORATION
5675 West 26th Street
Chicago 50, Illinois

Please send me the catalogs checked below:

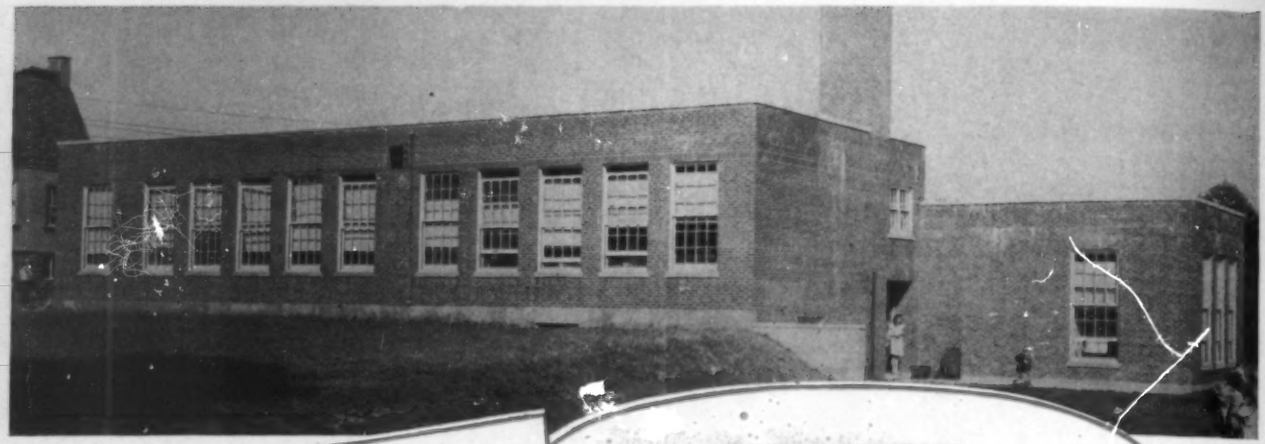
- ☐ Handbook of Ceco Products
- ☐ Ceco Steel Joists

Name .....

Address .....

City ..... State .....

makes the big difference



ELI WHITNEY SCHOOL
Stratford, Conn.
Frederick Bec[illegible]with, *Architect*
A. J. Mongillo, *Plumbing and Heatin[illegible]ntractor*

A good lesson in School "Specs" BYERS WROUGHT IRON *in 5 important services*

Heating and plumbing services—Hot and cold water lines, gas lines and waste and vents under 2-inches, are Byers Wrought Iron.

Radiant Heating Coils of Byers Wrought Iron are installed in first floor construction and ceilings.

One of the class-rooms, showing the completely usable area made available by radiant heating.

Here's an excellent example of how economics and engineering can be united in one specification. With an eye to maximum durability and minimum cost-per-year, the designers specified wrought iron in hot and cold water lines, gas lines, small waste and vent lines and the entire radiant heating system—all corrosive services. Byers Wrought Iron was used.

Wrought iron has served with distinction in many of the nation's oldest schools, and professional recognition of its durability is indicated by its widespread current use. Radiant Heating represents a newer trend, but a very definite one. In this installation Byers Wrought Iron pipe in sizes from ½-inch to 2½-inch was fabricated into floor and ceiling coils. Hot water, pump-circulated, is the heating medium.

The splendid satisfaction given by Byers Wrought Iron in corrosive services is due to its unusual structure. Tiny fibers of glass-like silicate slag, threaded through the body of high-purity iron, halt and diffuse corrosive attack, and anchor the initial protective film. Other advantages recommend it for radiant heating: high heat emission, ease of fabrication, and a coefficient of expansion almost identical with that of concrete and plaster.

Our bulletin, "Byers Wrought Iron for Radiant Heating" will give you some helpful information. Ask for a copy. And remember . . . Byers Wrought Iron is available now, in quantity, for any project.

A. M. Byers Co., Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Seattle, San Francisco, Atlanta.

"ETERNALLY YOURS"—professionally-produced 16mm sound motion picture. An entertaining saga of the wrought iron industry, available to technical groups. New, authentic, informative. Write Modern Talking Picture Service, Inc., 9 Rockefeller Plaza, N.Y. 20, N.Y.

CORROSION COSTS YOU MORE THAN WROUGHT IRON

BYERS
GENUINE WROUGHT IRON
TUBULAR AND HOT ROLLED PRODUCTS
ELECTRIC FURNACE ALLOY STEELS . OPEN HEARTH ALLOY STEELS
CARBON STEEL TUBULAR PRODUCTS

VOL. 99 • NO. 3 MARCH 1946

A COMPETITION FOR THE WORLD'S CAPITAL 65
An Editorial . . . by Kenneth K. Stowell

CHICAGO TACKLES ITS BUILDING CODE 66

A NEW PATTERN FOR BUILDING LEGISLATION 68
By Howard Vermilya

FULL FREEDOM FOR THE CHILDREN AND PEACE FOR PARENTS . 76
House for Mr. and Mrs. Richard P. Minor, San Mateo. Wurster, Bernardi & Emmons, Architects

CAPITAL FOR THE UNITED NATIONS 82
By Ed. Allen

MORE LAND FOR LONDON 86
County of London Plan Is First Detailed Proposal for the Deliberate Dispersal of Excess Population. By W. G. Holford

LE CORBUSIER PLANS FOR THE RECONSTRUCTION OF FRANCE . 92

BUILDING TYPES STUDY No. 111 . . . SCHOOLS 94

THE ARCHITECT IN ACTION ON SCHOOLS 95
School Planning Survey Methods of the Ernest J. Kump Co. By Douglas Haskell

FIRST POSTWAR SCHOOLS 100
By Ernest J. Kump Co., Consultants, Architects, Engineers. White Oaks School, San Carlos; Sunnybrae School, California

FIRST STUDIES FOR A MODEL SCHOOL IN NEW YORK 108
Oswego State Teachers College Practice School, Oswego, N. Y. Lorimer Rich and Robbins Conn, Architects

PACE-MAKING PROJECT FOR THE EAST 110
Perkins and Will, Architects and Engineers

AVERAGE SIZE DONE WITH SPECIAL CARE 111
Bellmawr Grade School, New Jersey. Joseph N. Hettel, and Mayer & Whittlesey, Associated Architects

APPLIED BRIGHTNESS CONTROL IN SCHOOL 114
By Kenneth C. Welch, A.I.A., I.E.S.

A RADICAL DEPARTURE IN DAYLIGHTING 120
Saugus Union School, California. Maynard Lyndon, A.I.A., Architect

HEATING AND VENTILATING SCHOOLS 122
Excerpt from Interim Report of a Canadian Committee of Architects

TIME-SAVER STANDARDS . . . Short Cuts to Solar Angles 125
By Hendrik P. Maas

THE RECORD REPORTS . . . News from the Field 7

FOR BETTER BUILDING 20
News of Materials, Equipment and Methods

MANUFACTURERS' LITERATURE 24

REQUIRED READING 28

INDEX TO ADVERTISEMENTS 210

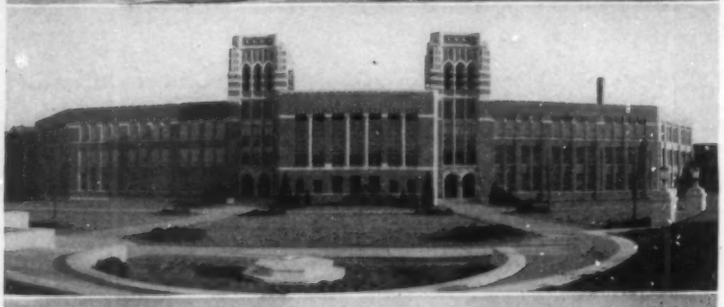
ARCHITECTURAL RECORD

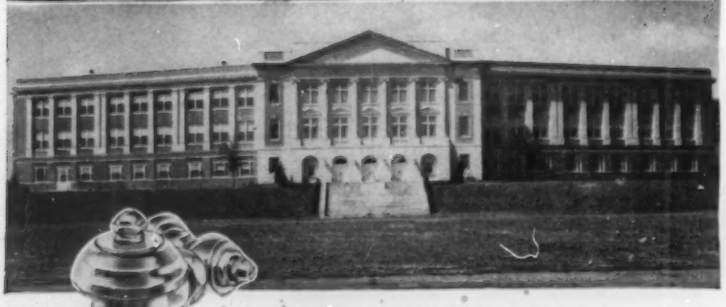
F.W.DODGE CORPORATION

Copyright 1946 with all rights reserved F. W. DODGE CORPORATION • Vice-President in charge of Magazine Division, H. Judd Payne • **EDITORS:** Editor-in-Chief, Kenneth Kingsley Stowell, A.I.A.; Managing Editor, Emerson Goble; Associate Editors, Douglas Haskell, Charles Mattlage; Associate in South America, Edmund J. Whiting, A.I.A.; Desk Editor, Florence A. van Wyck • **CONSULTANTS:** Industry Relations Consultant, Thomas S. Holden; Statistical Consultant, Clyde Shute; Building Economics Consultant, Norbert Brown; Field Research Consultant, Clifford Dunnells, Jr.

Architectural Record (combined with American Architect and Architecture) is published monthly by F. W. Dodge Corporation, 10 Ferry St., Concord, N. H., with Editorial and Executive Offices at 119 West 40th Street, New York, N. Y. Thomas S. Holden, Pres.; Howard J. Barringer, Vice-Pres. and Treas.; Irving W. Hasselman, Vice-Pres.; Chauncey L. Williams, Vice-Pres.; Sanford D. Stockton, Jr., Secy.; Walter F. De Saix, Asst. Treas.; Edward E. Freed, Asst. Treas. Member Audit Bureau of Circulations and Associated Business Papers, Inc. Architectural Record is indexed in Reader's Guide, Art Index and Industrial Arts Index. Subscription rates, United States and Possessions, Canada, Cuba, Mexico, Central and South America, $3 the year, $5 for two years, $6 for three years; elsewhere, $5 the year; single copy, $1. Circulation Manager, Marshall Glen. Every effort will be made to return material submitted for possible publication if accompanied by stamped, addressed envelope, but the editors and the corporation will not be responsible for loss or damage. Other Dodge Services: Real Estate Record & Builders' Guide, Sweet's Files, Home Owners' Catalogs, Dodge Reports & Dodge Statistical Research Service.

Selecting FLUSH VALVES FOR SCHOOLS





A RECENT survey among architects, widely experienced in school design, discloses a number of interesting trends in flush valve applications for schools.

For example, it shows that concealed and top spud flush valves continue to be preferred for most installations, while foot-action flush valves seem to be gaining in popularity. Silent-action flush valves are preferred 3 to 2. These and other trends are discussed in the booklet offered below.

Of course, a primary consideration in the selection of any flush valve combination is dependable, trouble-free *performance* — characteristic of all Watrous Flush Valves.

Very important also is *economy*—here the simple Watrous Water-Saver adjustment makes possible savings of many thousands of gallons of water each year.

Maintenance is another factor. This has been simplified by the convenient, single-step servicing feature of Watrous Flush Valves.

Noise reduction, gained through the use of Watrous "Silent-Action" Flush Valves, is becoming increasingly important.

Combine all these qualities in the flush valves for your new school or modernization program by choosing Watrous Flush Valves—a selection that will be a constant source of satisfaction over the years to come.

Chicago South Side Vocational School is Watrous Flush Valve equipped throughout, John C. Christensen, Architect. Dvorak & Gazin, Plumbing Contractor.

Wyandotte High School, Kansas City, Kans., Watrous equipped. Hamilton-Fellows & Nedvid, Chicago, Architects. J. W. Radotinsky, Kansas City, Kans., Assoc. Architect. Interstate Heating and Plumbing Co., Kansas City, Mo., Plumbing Contr.

Lake Placid High School, Lake Placid, N. Y., equipped with Watrous Flush Valves. H. O. Fullerton, Albany, N. Y., Architect. A. J. Eckert Co., Inc., Plumbing Contractor.

ARCHITECTS' VIEWS ON FLUSH VALVE APPLICATIONS

A survey of interesting trends in the selection of flush valves for schools is given in Bulletin No. 477. Write for your copy.

THE IMPERIAL BRASS MFG. CO., 1240 W. Harrison St., Chicago 7, Ill.

Watrous Flush Valves

THE RECORD REPORTS

Housing Expediter Wyatt Tackles the Housing Problem • CPA Channels Materials • Foley Asks Cut in Building Costs • Public Works Provided for in Federal Budget

Architects, home builders, suppliers — all face increasingly challenging and changing problems as the nation nears the peak of its unprecedented housing shortage.

Summer will see the crisis even more severe than now, is the warning from Washington. Reshuffling will be called for in many things. Complications will multiply in more.

The shifting federal scene, as spring approached, threw the weight of the Administration behind the Patman bill to put price ceilings on houses (and to add urban lots) and brought a decision to use the bill, after decided modifications, as a vehicle for other housing powers.

Priorities, prefabrication, subsidies, bottlenecks, strikes and lack of labor, community codes — these are but part of the involved mélange of old and new problems on the building front worrying Washington.

Wyatt Takes Over

Wilson W. Wyatt, the nation's Housing Expediter, who succeeded on February 1 to John B. Blandford's post as head of the National Housing Administration, tackled his prodigious task directly and boldly. After a series of some 30 conferences with building and related groups, he drafted plans and set actively about carrying them out. His studies embraced the new field of construction subsidies in the reconversion emergency period. He made clear that the housing shortage will not restrict itself to 1946 and that a two-year program is essential.

Expediter Wyatt attached prime importance for quick relief to the use of idle wartime structures. He pressed for their revamping into, at the least, temporary dwellings, since the impasse cannot await normal building procedures. He stressed the need for families to double up in existing houses.

Community Role Stressed

He pointed to the role of local communities in tackling their own difficulties, particularly removal of restrictions in their building codes which would prevent new approaches. He began the establishment of conference groups on housing in the various communities. He called for local utilities to preserve services for outlying wartime housing projects. He encouraged new substitute materials and extensive use of prefabrication.

The Expediter's specific target for 1946: 1,200,000 homes — 700,000 conventional construction; 250,000 permanent prefabricated houses, and houses assembled on-site from prefabricated parts and materials; 250,000 temporary units. Sights are boosted for 1947: 1,500,000 homes — 900,000 conventional; 600,000 prefabricated.

Emphasis attaches to the following:

Greatly expanded production of conventional and new-type materials by (a) premium payments for increased production, (b) guaranteed markets for materials manufacturers, (c) equipment and materials priorities, (d) wage-price adjustments or price increases where necessary and non-inflationary, (e) use of war plants and new facilities to increase production capacity, (f) rapid tax amortization for new or converted building materials plants, and (g) government absorption of undue risks in development work on new type materials.

Other points:

1. Veterans' preferences.
2. Tripling of present labor force in home building.
3. Postponing deferrable and non-essential construction.
4. Channeling most materials to homes $6,000 or under and rental housing $50 per month or under.
5. Price control on building materials, new and existing homes, building lots and rents.
6. $250,000,000 for temporary re-use war housing.
7. Early enactment of the Wagner-Ellender-Taft Bill.

"Materials deficits," says Mr. Wyatt, "must be made up by greatly expanded production of conventional materials and by the use of new types of materials. The possibilities in this direction are significant. The use of metal window sash and framing instead of lumber has already been introduced. Composition and plastic materials are available for flooring to supplement scarce seasoned hardwoods. Pre-assembled unit bathrooms and kitchens can economize both material and manpower. Examples of this sort can be multiplied."

The Civilian Production Administration's newly-formed Industry Advisory Committee on Prefabricated Housing estimated that one-fourth of the 1946 veterans' preference moderate-cost homes could be built by prefabrication, provided the government assists the industry in obtaining materials. It presented its estimates as the CPA considered priorities for such construction.

Materials Channeled

CPA joined efforts with Wyatt, aiming especially at channeling available building materials into low-cost housing. Under the veterans' preference program it shunted lumber and millwork that way. It used subsequent "directions" to send along other materials, including cast iron bathtubs, soil pipe, gypsum and clay products, brick, tile, etc.

(*Continued on page 10*)

"What, no theme center — no time capsule?!"

— Drawn for the RECORD by Alan Dunn

NOW IBM

OFFERS NEW, PERFECTED ADMINISTRATIVE AIDS

IBM has always recognized its *one responsibility*—to furnish the finest, most modern administrative equipment for any type of project—whether for complex college or university, or the smallest school.

Today, IBM administrative aids are again available—new, improved, perfected. Available, too, are IBM representatives to work with owners, architects, engineers and contractors in helping to make each and every building a permanent asset.

Ask an IBM representative for his complete and fully responsible advisory service. It is yours without cost or obligation.

INTERNATIONAL BUSINESS MACHINES CORPORATION

World Headquarters Building · 590 Madison Avenue · New York 22, N.Y.

IBM

AUTOMATIC ADMINISTRATIVE AIDS

COMPLETE SERVICE . . . ONE RESPONSIBILITY

Self-Regulating Electric Time Systems

One time—throughout—eliminates disrupting confusion. All secondary clocks in the IBM system are automatically checked and, if necessary, corrected hourly through IBM's Master Time Control, a timing device of split-second accuracy.

Interior Telephone Systems

Instant intra-communication is provided by IBM Interior Telephone Systems. For both efficiency and economy, IBM Telephone Equipment may be incorporated with the IBM Program Bell System or Sound Distribution System.

Program Signaling Systems

Complex schedules of signals operate automatically in agreement with the indicating clocks or recorders. Schedule changes may be handled easily, quickly. Gongs, bells, buzzers, chimes, directional horns, whistles, may be specified.

Fire Alarm Systems

The IBM Fire Alarm Systems are designed to meet these necessary requirements: certainty of operation; simplicity in initiating alarms; certainty of alarm reception by persons at any location. These systems are approved by the Underwriters' Laboratory, Inc.

Sound Distribution Systems

Central control is provided for reproduction, amplification and distribution, to widely separated assemblages, of sound originating from radio, phonograph or microphone. The system includes an IBM "return speech" feature permitting selective two-way communication at the flick of a switch.

Laboratory Electricity Panels

Complete protection from accidental shocks is provided in IBM laboratory Electricity Panels, which deliver currents of all characteristics and voltages to the instructors' and students' tables or to any location where electricity is needed in scientific experimental work.

Time Recording Systems

IBM Time Recording devices are of many types such as Attendance Recorders; Time Stamps for noting receipt of correspondence; Door Recorders; Watchman's Clocks.

THE RECORD REPORTS (*Continued from page 7*)

In agreement with the Commerce Department, CPA cut first quarter allocations for lumber export nearly 35,000,000 board feet below the 1945 average.

Meanwhile, the National Housing Agency worked out with the industry a public information committee with Howard B. Smith, director of the Department of Real Estate Finance of the American Bankers Association, as chairman. Others on the committee included: F. Stuart Fitzpatrick, U. S. Chamber of Commerce; Henry P. Irr, United Savings and Loan League; James W. Follin, Producers' Council; William G. Nicholas, Congress of Industrial Organizations; Harry C. Bates, American Federation of Labor; H. R. Northup, National Retail Lumber Dealers Association; Harold P. Braman, National Savings and Loan League; Frank Cortright, National Association of Home Builders; Walton Onslow, National Association of Real Estate Boards; John W. Sandstedt, National Association of Mutual Savings Banks.

Foley Asks Cut in Costs

Raymond M. Foley, Federal Housing Administrator, stressed the task of private enterprise in attacking the cost of building. This, he said, "does not involve cutting wages. It does involve a concerted effort of all concerned, the producers of materials, fabricators, vendors, builders, real estate men, lenders, labor — from the mine, the forest and the quarry, down to the finished sold or rented house — an earnest inquiry as to whether any of us are seeking to get too much for too little."

The answer, Mr. Foley declared, is to be found "in efficiency, in readiness to adopt new methods and techniques; in removal of unnecessary restrictive requirements wherever they may be — in business, in local or federal government, in labor, in law."

Strikes Watched

As the new year moved along through January and February, the Administration had other headaches affecting construction. Their migraines came notably from the industry-crippling steel strike and the stoppage of electrical workers. While the main concern naturally was settlement of the disputes, officials displayed concern also over effects of the steel delay on construction. In the electric strike they called on the electrical equipment industry to conserve stocks and spread them evenly among customers so that hospitals, public utilities and other essential emergency needs would be cared for.

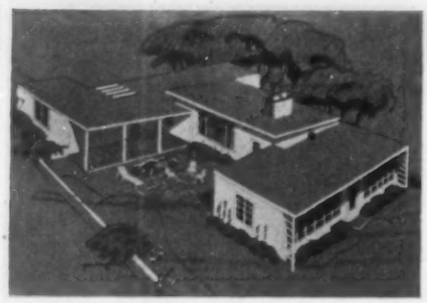
With a constant eye to building bottlenecks, federal officials are keeping a close watch on materials production. Despite the inadequacy of supply and the backlog of unfilled orders, output is increasing, they learn, in practically all instances. Lumber was an exception, with labor and equipment shortages as the chief retarding factors, although the equipment bottleneck had begun to ease.

Shortages Are General

Clearest sign of the general shortage is the depletion of inventories and the piling up of unfilled orders on every hand. In January, for instance, unfilled orders for clay sewer pipe equalled two months' production, for structural insulating board eight to 12 weeks' production, for concrete building blocks from two to three months' production. In the case of electrical wiring materials and lighting fixtures, delivery dates ranged from two to six months. For fractional motors, unfilled orders were equalling 12 to 18 months' production.

Washington notes that construction costs and prices of building materials continue to move upward. The Stabiliza-

(*Continued on page 12*)



The "Madison," Wanamaker's one modern

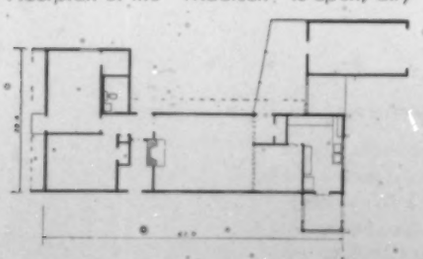
Traditional "Queen Anne" is spacious

PREFABS SHOWN

It seems to have become fashionable for city department stores to show, and sometimes to sell, neat little prefabricated houses. The crowds love it, flocking to the shows in almost terrifying numbers, and asking innumerable questions.

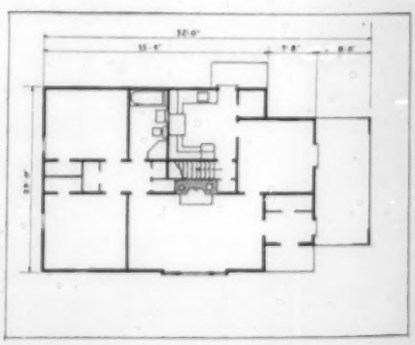
One of the most imposing of the shows staged thus far is the one currently on view at John Wanamaker's both in New York City and in Philadelphia. Called the "Village of Vision," it occupies the entire eighth floor of the south building of the New York store and consists of full-sized, completely furnished Johnson "Quality Homes." The houses range in size from the tiny 20 by 32 ft. "Lane" to the 73 by 73 ft. "Madison." All but one of the seven houses in the group is traditional in style; six of them have two bedrooms each, the seventh has three. Three have separate dining rooms, two others have dinettes. Four have utility rooms. The prices range from $2,527 to $4,669 for the house shell only, but Wanamaker's is not taking orders.

Floorplan of the "Madison" is open, airy



Comments of the crowds viewing this show are varied. Most frequently heard criticism is the small size of the rooms, particularly the bedrooms. Many people seem to find the interior partitions "flimsy," the closets "too few and too small." The large window areas and the utility rooms, on the other hand, are highly popular.

Macy's in New York is taking orders for Precision-Built Homes costing from approximately $5,000 to $10,000 complete except for the land. These prices include excavation, foundation and base-



The "Queen Anne's" compact floor plan

ment, construction and erection, papering and painting the interior, complete exterior finish, plumbing and plumbing fixtures, sewer, forced warm air furnace, kitchen range, full screens and electric wiring and fixtures. Since all of these items are extras in the Johnson-Wanamaker plan, the price range of the two groups of houses is about the same.

How the fugitive fuel became champion...

OF FUGITIVES FROM DRUDGERY

Gas has no shape and little weight. It's fugitive, but once engineers captured it, gas proved most susceptible to automatic application. And, because gas requires no storing by the user, is inherently clean, leaves no messy residue, gas has become the champion of fugitives from household drudgery.

Almost half the member companies of Dresser Industries, Inc., are constantly seeking new and better ways of converting the nation's trillions of cubic feet of gas into more profitable industrial application and more luxurious living. Bryant Heater Co., for instance, has perfected an entirely automatic oven range lighter. It lights the oven of gas ranges from a dial at the top of the range, safely, quickly and conveniently. Day & Night has engineered the Panelray unit, using gas to provide radiant heating, a blessing much in the minds of today's home designers. Payne Furnace has solved the needs of a climate which calls for quick heat all the year-round. It's done with a flexible, warm air house heating system known as Zone Conditioning, using multiple furnaces, individually controlled.

Through teamwork, Dresser Industries has engineered America's vast treasure in gas to provide heat for homes and factories, dried air for air conditioning, hot water and industrial steam. All the appliances operate at the touch of a button and, true to the Dresser pattern, they're *First to be new—Last to wear out.*

BOVAIRD & SEYFANG Manufacturing Co., Bradford, Pa.

BRYANT Heater Company, Cleveland, Ohio

CLARK Bros. Co., Inc., Olean, New York

DAY & NIGHT Mfg. Co., Monrovia, Calif.

DRESSER Manufacturing Div., Bradford, Pa.

DRESSER Manufacturing Company, Limited, Toronto, Ont., Canada

INTERNATIONAL Derrick & Equipment Co., Columbus, Marietta & Delaware, Ohio; Beaumont, Texas; Torrance, Calif.

KOBE, Inc., Huntington Park, Calif.

PACIFIC Pumps, Inc., Huntington Park, Calif.

PAYNE Furnace Co., Beverly Hills, Calif.

ROOTS-CONNERSVILLE Blower Corp., Connersville, Ind.

SECURITY Engineering Co., Inc., Whittier, Calif.

STACEY BROS. Gas Construction Company, Cincinnati, Ohio

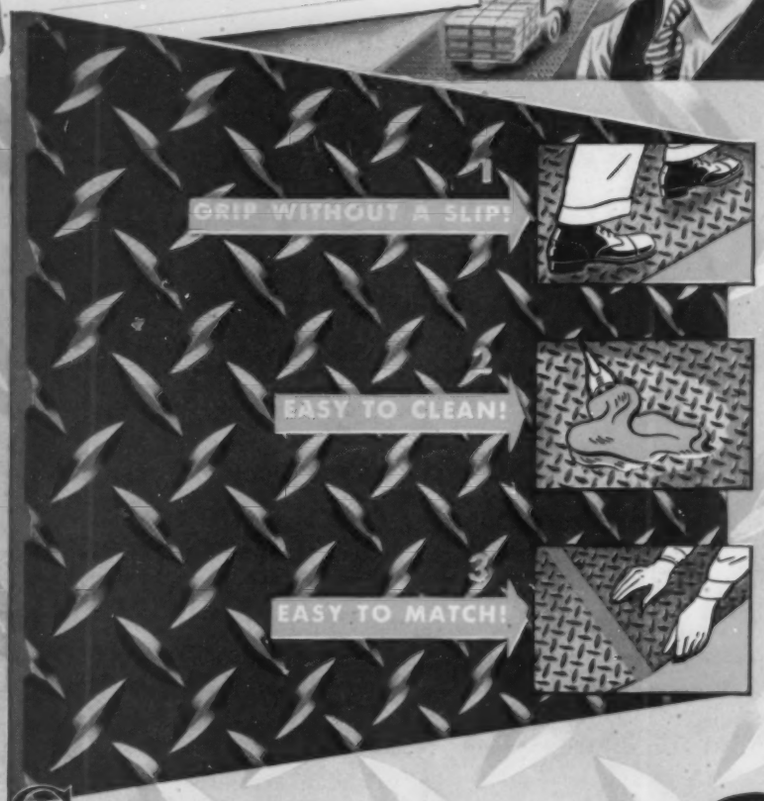
VAN DER HORST Corp. of America, Olean, N. Y., and Cleveland, Ohio

Creative Engineering
IN THE USE OF GAS...

DRESSER INDUSTRIES, INC.

TERMINAL TOWER • CLEVELAND 13, OHIO

Geared to anticipate the course of industry
Oil and gas equipment a specialty



So you can Count on these 3

To the inherent characteristics of steel floor plate (such as durability, ability to stand tough traffic, oil, heat, fire and crackproof and no maintenance cost) add, for A. W. Super-Diamond these three distinctive advantages well worth knowing about for safer floors. Notice the shape of the elevations and the pattern? 30% minimum contact area with the shoe. Sloping sides that maintain "sharpness" of contact, resist dirt collection, make for easier cleaning, better draining. And a pattern that matches more easily with less scrap! These are reasons why alert architects, builders, product engineers, and purchasing agents are insisting on AW Super-Diamond Floor Plates.

Write For 16 page Booklet L-33 Giving Helpful Information on Weight Per Square Foot and Maximum Sizes. Alan Wood Steel Company, Conshohocken, Pa.

AW SUPER-DIAMOND

FLOOR PLATES THAT GRIP

A Product of ALAN WOOD STEEL COMPANY

THE RECORD REPORTS

(*Continued from page 10*)

tion Office and the OPA themselves are sanctioning boosts. Stabilization Chief Collett concurred in wage increases in several building material industries to aid in recruiting manpower. The action covered common and face brick, structu. al clay tile and clay sewer pipe. OPA joined in a simultaneous price and wage increase in the cast iron soil pipe and fittings industry. It extended to May 15 the short-term 5 per cent increase allowed construction machinery manufacturers last fall.

OPA also joined with the FHA in a program delegating to FHA authority to place rent ceilings on new rental housing units. Aim was to speed construction of this type of housing. FHA field offices were told to fix rentals at no more than 20 per cent higher than on comparable housing at the time of the rental freeze date.

Public Works Planned

The 800-page federal budget reveals some interesting planning in the field of public works aside from public buildings, which are being delayed. Due to the low level of construction during the war, the program for the fiscal year beginning next July will be considerably larger than the prewar average. Completion of suspended projects, provision of additional facilities and Congressional expansion of items such as veterans' hospitals, rural electrification, dams, highways, etc., are expected to mount to a total of $1,353,000,000 compared to $295,000,000 during the fiscal year 1945. Authorities admit, however, that availability of materials and manpower may modify these estimates.

In addition to current hospital funds, the budget proposes $147,442,500 for the 12 months after next June. It points out that construction of veterans' facilities will be a continuing program for the next several years.

Plans for rural electrification propose $250 million for loans to local cooperatives and public bodies for extension of distribution lines to rural areas.

To Work on Dams

The Bonneville Power Administration contemplates construction of transmission lines, sub-stations and related facilities. The Southwestern Power Administration, covering projects in Louisiana, Arkansas, southern Missouri, southern Kansas, most of Oklahoma and eastern Texas, expects to expand its transmission lines, its feeder lines, its fuel-electric generating stations and to use $500,000 for plans and specifications for future projects.

The Bureau of Reclamation will ex-

(*Continued on page 14*)

G-E LAMPS
. . for the latest lighting!

Many new G-E lamps are on the market today. You'll find them helpful in carrying out your own modern lighting ideas. And all of them bring you the benefits of G-E lamp research whose constant aim is to make G-E lamps stay brighter longer!

GET THE FACTS OF LIGHT!

A lighting consultant from our nearest G-E Lamp office will be glad to help you—just call or write!

ATLANTA 3, GA., 187 Spring St., N.W., WAlnut 9767
BOSTON 10, MASS., 50 High St., HANcock 1680
BUFFALO 2, N. Y., 901 Genesee Bldg., CLeveland 3400
CHICAGO 80, ILL., 842 So. Canal St., HARrison 5430
CLEVELAND 14, OHIO, 1320 Williamson Bldg., CHerry 1010
DALLAS 2, TEXAS, 1801 North Lamar St., Central 7711
DENVER 2, COLO., 1863 Wazee St., MAin 6141
DETROIT 26, MICH., 1400 Book Tower, CHerry 6910
KANSAS CITY 8, MO., 2100 Wyandotte St., Victor 7671
LOS ANGELES 13, CALIF., 601 West Fifth St., Michigan 8851
MINNEAPOLIS 13, MINN., 500 Stinson Blvd., GRanville 7286
NEW YORK 22, N. Y., 570 Lexington Ave., Wickersham 2-6300
OAKLAND 7, CALIF., 1614 Campbell St., Highgate 7340
PHILADELPHIA 2, PA., 1405 Locust St., KINgsley 3336
PITTSBURGH 22, PA., 535 Smithfield St., GRant 3272
PORTLAND 9, ORE., 1238 N. W. Glisan St., BEacon 2101
ST. LOUIS 1, MO., 710 No. Twelfth St., CHestnut 8920
General Offices, NELA PARK, CLEVELAND 12, OHIO

G-E LAMPS
Stay Brighter Longer!
GENERAL ELECTRIC

Philadelphia Story about TERRAZZO

Customers are attracted by the distinctive Terrazzo flooring at the Bond Clothing Store, Philadelphia. Its wearing qualities are ideally suited to the job. For Terrazzo bears constant heavy foot traffic without losing its original beauty.

A Matrix of Atlas White Cement permits an architect unlimited choice of design and any combination of colors. It serves the same purpose for Terrazzo as a white canvas serves for the artist's painting. It brings out the true tones of aggregates and mineral pigments in a way that cannot be equalled by a gray background.

Send for further information. Write to Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

AR-T-11

The matrix is as important as the marble chips

ATLAS WHITE CEMENT
for FINE TERRAZZO

A UNIVERSAL ATLAS PRODUCT

THE RECORD REPORTS

(*Continued from page 12*)

pand construction in 17 western states, including projects in the Columbia River Basin, Central Valley of California, Missouri River Basin, and the Colorado River Basin. The work will include continuance of the Hungry Horse Dam on the Columbia River, the Keswick Dam, the Shasta Dam and power plant and other work in the Central Valley of California, and the Davis Dam in the Colorado River Basin. Flood control and related work by the Army engineers is in addition to these projects.

White House Expansion Stirs Tempest

Federal planning stirred up what President Truman called "a tempest in a teapot" when it provided extensions to the White House. Criticism ran all the way from keeping the historic character of the White House unchanged to questioning the architectural features themselves. The House of Representatives argued the matter hotly and actually removed from an appropriation bill the funds for the remodeling and expansion of the executive offices. Before this action could stand permanently, however, the Senate would have to accept the House stand.

Rural Health Plans Made

Among postwar plans for rural areas is one for better health. The Department of Agriculture has drawn up detailed suggestions for farm communities, including facilities. It points out that rural sections should have about three or four general hospital beds for every thousand people and suggests a state master plan to determine the facilities needed.

In suggesting means of providing funds, it points out that a good rural hospital of 50 beds would cost about $250,000 to build and equip properly. It probably would be best, says the Department's Inter-Bureau Committee on Postwar Programs, for the average rural community to be served by an institution of 50 to 75 beds with good equipment for general surgery, for maternity service, and for diagnosis and treatment of the most important diseases.

"There is another type of health-facility construction which, in a way, is even more important than the hospital," the Committee says further. "That's the health center — a building for the administration and provision of modern preventive and treatment services. At least one of these centers ought to serve every rural county in the United States. This is a less costly project than a general hospital and can be launched more readily." (See AR, Aug., 1945.)

The Committee recommends that such

(*Continued on page 16*)

BUILD WITH

STRAN STEEL

FOR A BETTER INVESTMENT FROM THE START...

The initial cost of Stran-Steel framing is low, but additional savings—progressively greater as the years go by—manifest themselves in the form of lower upkeep and maintenance costs.

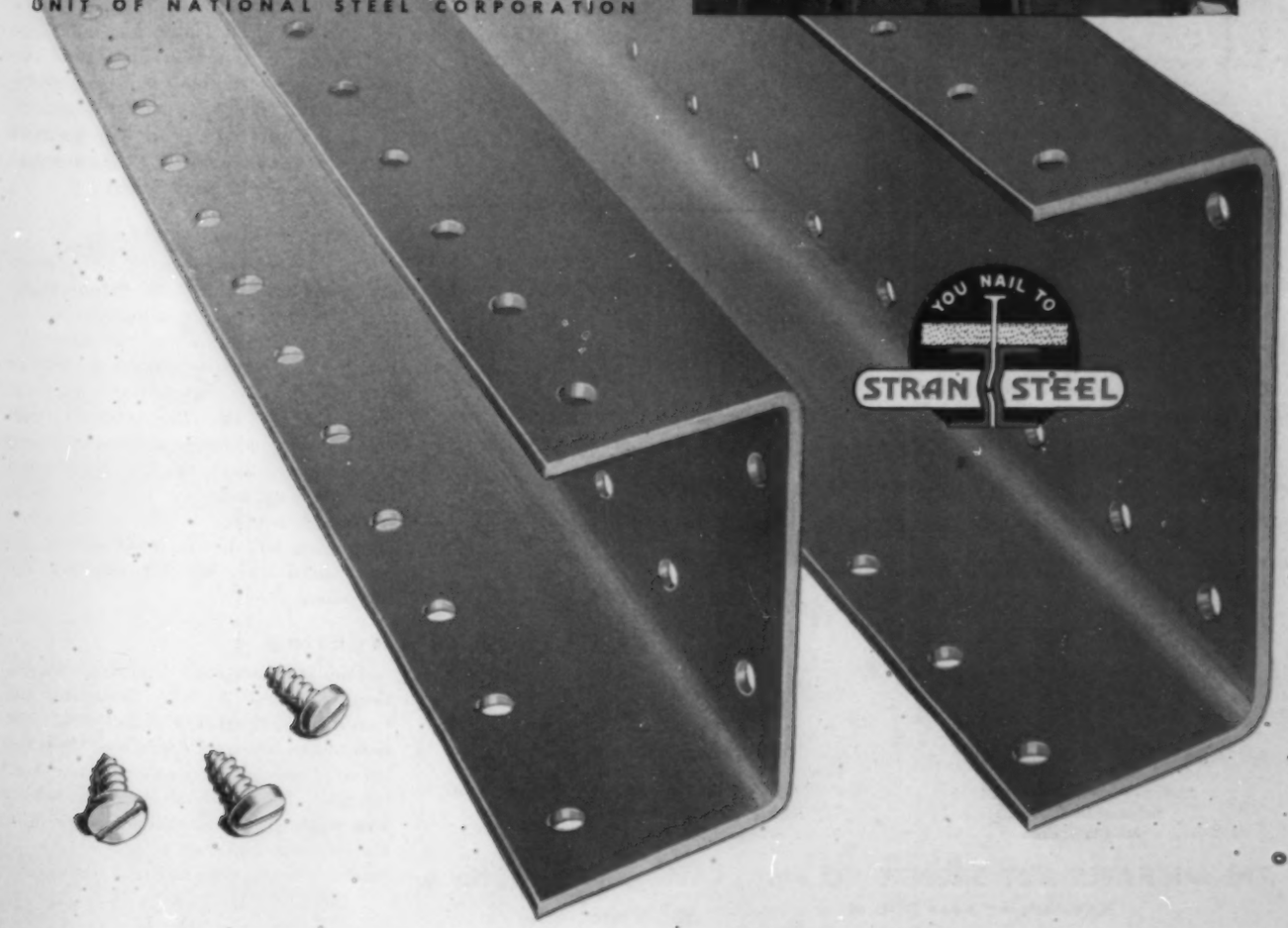
An efficient, lightweight, all-steel framing method, the Stran-Steel system is truly practical for light-load buildings . . . chiefly by virtue of the patented nailing groove, which permits collateral materials to be nailed directly to framing members. Economy and fast erection are especially evident in apartments and housing projects, but in other structures—such as individual homes, stores and industrial buildings — owners are quick to appreciate the additional Stran-Steel advantages of fire-safety, permanence and uniform quality . . . of freedom from sag, warp and rot.

Investigate this modern framing material. For detailed information, see Sweet's File, Architectural, or Sweet's File for Builders . . . or refer to the January issue of Building Supply News.

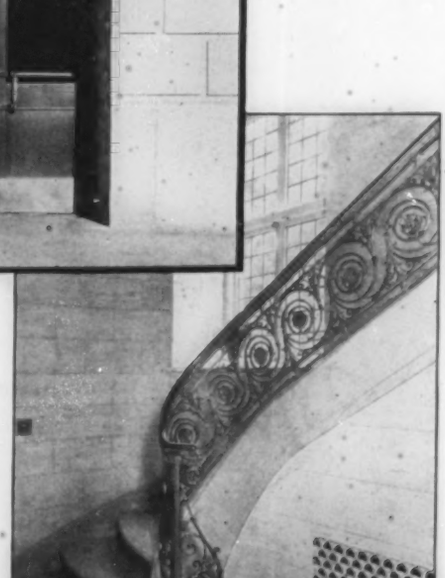
GREAT LAKES STEEL CORPORATION

STRAN-STEEL DIVISION • PENOBSCOT BUILDING, DETROIT 26, MICHIGAN

UNIT OF NATIONAL STEEL CORPORATION



Don't Overlook
MICHAELS PRODUCTS
in Your Building Plans



The manufacture of ferrous and nonferrous metal building products has always been a major part of our business. And now that restrictions are lifted, and materials obtainable, we offer to architects and builders a variety of bronze, aluminum and nonferrous metal products. For specific requirements Michaels craftsmen will faithfully reproduce in metal the most intricate architectural designs. If your plans include metal products, write us.

MICHAELS PRODUCTS

Fixtures for Banks and Offices
Welded Bronze Doors
Elevator Doors
Elevator Enclosures
Check Desks (standing and wall)
Lamp Standards
Marquise
Tablets and Signs
Name Plates
Railings (cast and wrought)
Building Directories
Bulletin Boards
Stamped and Cast Radiator Grilles
Grilles and Wickets
Kick and Push Plates
Push Bars
Wrought Iron and Bronze Lighting Fixtures
Wire Work
Cast Thresholds
Extruded Thresholds
Extruded Casements and Store Front Sash
Bronze and Iron Store Fronts
Bronze Double Hung Windows
Bronze Casement Windows

THE MICHAELS ART BRONZE CO., Inc., Covington, Kentucky

Manufacturers since 1870 of many products in Bronze, Aluminum and other metals

THE RECORD REPORTS

(*Continued from page 14*)

a health department be housed in a modern sanitary building and located, if possible, in close relation to the main general hospital of the area.

In connection with rural areas, it should be noted that one of the proposals in connection with the National Housing Bill is for the Secretary of Agriculture to furnish technical services either for a fee or free of charge. This could include building plans, specifications and architectural supervision, and inspection of construction.

EXPOSITIONS

Modern Homes

A National Modern Homes Exposition, the first since the war, will be held at Grand Central Palace, New York City, May 4–11 under the sponsorship of the metropolitan Association of Real Estate Boards and with the cooperation of the FHA. Exhibits will pertain to the design, location, financing, construction, equipping, furnishing, modernizing, landscaping, servicing and maintenance of individual house or apartment.

Construction Industries

The first annual Construction Industries Exposition and Home Show will be held in the Los Angeles Pan-Pacific Auditorium July 12–21, 1946. Sponsors are the Southern California industrial and home construction industries and the Los Angeles Chamber of Commerce. Exhibits of every type of materials, products and facilities for the business man, the home owner and the construction engineer will be included.

Plastics Exposition

The present status of all the plastics and their possibilities for future application in all types of industries will be presented graphically in the first National Plastics Exposition, to be held in Grand Central Palace, New York City, April 22–27, 1946. The general public will be admitted to the show only during the last three days, the first three being reserved for industry representatives. Technical experts of the participating companies will be on hand during the first three days for consultation and discussion.

Lighting

The International Lighting Exposition sponsored by the Industrial and Commercial Lighting Equipment Section of the National Electrical Manufacturers Association, postponed last April because of governmental restrictions, is now scheduled to be held April 26–30 at the Stevens Hotel in Chicago. Over 60 leading lamp and lighting equipment

(*Continued on page 142*)

Whether you run a business, supervise a store or plan an airport, if you're interested in figures you'd better meet Kentile—the floor that lasts longer, looks better—costs less!

Consider these facts when you consider your flooring:

GREASEPROOF KENTILE costs only slightly more than regular Kentile—and can be used only where needed. It's made in 16 regular Kentile colors.

IS IT HANDSOME? With Kentile you can have your own floor design. Kentile true-color squares are laid in the color combinations and patterns *you* decide will serve you best!

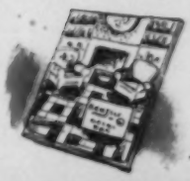
IS IT PRACTICAL? And how! It shows no scars, absorbs no moisture. Kentile cushions sounds, is resilient underfoot, and sure-treaded.

WHAT'S THE UPKEEP? Practically none! Kentile cleans with soap and water mopping, and colors stay true. When floor plans are altered or replacements needed, all you do is add new squares—without ripping up the floor.

WHAT'S THE COST? Kentile is asphalt tile—the lowest cost long wearing resilient tile flooring sold, foot by foot, every time. Installation is so easy it costs less installed. And because it wears longer it is incomparably cheaper.

THE WHOLE STORY!

Altogether, Kentile offers 15 different advantages. They're all told in the new, richly illustrated full-color catalogue that shows all the Kentile colors and some of the countless patterns possible—plus full-color pictures of Kentile in actual use. Send for your copy today—no obligation.



DAVID E. KENNEDY, INC.
78 Second Avenue, Brooklyn 15, N. Y.
208 Bona Allen Bldg., Atlanta 3, Ga.
2000 Ulloa Street, San Francisco 16, California
30 No. Michigan Ave., Chicago 2, Illinois
452 Statler Bldg., Boston 16, Mass.
614 Olympia Road, Pittsburgh 11, Pa.
1211 National Broadcasting Co. Bldg., Cleveland 14, Ohio

Otis elevators, Otis escalators, Otis trained men and the facilities of the manufacturers of more than half of the world's elevator equipment are all available to assist you or your Architect in solving any vertical transportation problem.

Otis Passenger Elevators with up-to-date dispatching methods are the recognized answer to congested elevator traffic conditions.

Otis Escalators are used where large numbers of persons are to be carried from floor to floor in comfort and without crowding.

Otis Freight Elevators with a variety of control systems are designed to satisfy the most exacting requirements of floor to floor freight handling.

For the most efficient and economical service in vertical transportation — for a few stories or many — call your nearest Otis Representative today.

Otis ELEVATOR COMPANY
OFFICES IN ALL PRINCIPAL CITIES

ANOTHER EXAMPLE OF JOHNSON INDIVIDUAL ROOM CONTROL

SAVE FUEL IN "DARK" OFFICES
with JOHNSON *Automatic* Dual *Temperature* CONTROL

Public Service Building, Portland, Oregon. A. E. Doyle and Associates, architects. Kendall Heating Co., mechanical contractors.

SINCE 1928, with Johnson *Dual* control of room temperatures, the Public Service Building in Portland, Oregon, has saved countless tons of fuel which a building of that size otherwise would have consumed. When the day's work is done, a reduced economy temperature is maintained in the rooms which are not in use. Tenants who work "overtime" merely push a button on the Johnson *Dual* thermostats in their offices. Thus, only the occupied spaces, suggested by the lighted windows in the illustration, are heated to 70°.

There are 274 Johnson *Dual* thermostats which control the Johnson valves on 440 radiators in this modern office building. Each of those thermostats is arranged to maintain, automatically, either of two temperatures—a suitable "occupancy" temperature of, say, 70°, and reduced "economy" temperature for non-occupancy hours. At the close of the normal business day, all of the thermostats in the building are set to the lower temperature, by a clock or manual switch at the operating engineer's station. Tenants who return to work in the evening restore the occupancy temperature setting readily, at their own thermostats. Later on, the central switch again resets the system to operate at the economy temperature level for the rest of the night.

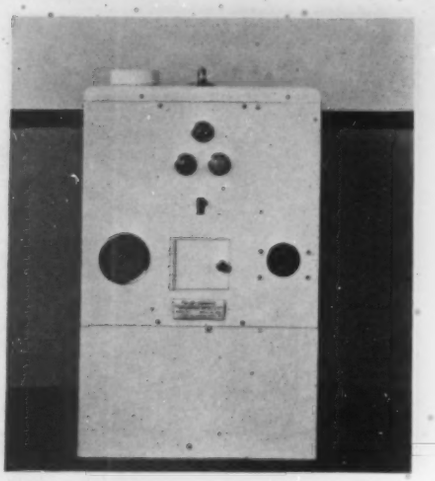
Temperature comfort for each tenant is modern building service. Substantial fuel saving for building budgets is modern building management. All buildings, new or old, find individual room temperature control extremely valuable. Regardless of climatic conditions, or of the particular problems involved, Johnson Automatic Temperature Control systems are designed and built to "fit the need."

Johnson designs, manufactures, installs and services its automatic temperature control systems. Completing the whole job is the proved method for assured satisfaction. Whatever the problem in automatic regulation of heating, ventilating and air conditioning, Johnson engineers are prepared to cooperate. The Johnson nation-wide organization places experts near by. Consultation does not obligate. Let us talk over your control problems with you, now. JOHNSON SERVICE COMPANY, Milwaukee 2, Wisconsin, Direct Branch Offices in Principal Cities.

JOHNSON *Automatic Temperature and Air Conditioning* **CONTROL**

DESIGN • MANUFACTURE • INSTALLATION • SERVICE

FOR BETTER BUILDING



Germicidal Vaporizer

AIR STERILIZER

Within the next few months there will be placed on the market an air-conditioning unit operating on the principle of chemical dehumidification. The vaporized dehumidifying agent, triethylene glycol, circulated with the treated air acts to control air-borne bacteria. Units will operate on ordinary house current, and will be made to treat the air in any space from a single room to a hospital. It is claimed that tests in Army and Navy hospitals indicated that complete air sterilization is possible. Rogers Diesel and Aircraft Corp., 1120 Leggett Ave., New York 59, N. Y.

PHOTO-MURALS

By applying a newly-developed emulsion, any smooth surface may be prepared for the direct printing of photographs. In this way reproductions of any desired size may be obtained on plaster, metal, wood or plastics. Prints on metal or wood can be proofed against weather by a lacquer or varnish finish, and signs at the producer's plants are said to have withstood exposure for five years or longer. The Glenn L. Martin Co., Baltimore 3, Md.

ELECTRONIC SWITCH

The electronic *Sun Switch* has been developed for automatic control of street lighting service to provide required illumination regardless of fluctuations in weather conditions. This unit will be priced low enough to permit installations on each light pole. The manufacturer suggests device could also be used effectively to light public buildings, airports, etc. The Ripley Co., Torrington, Conn.

STAINPROOF WALLS

High resistance to wear and tear is claimed for a new wall covering, *Varlon*, for which it is also stated that field tests have proved that heretofore indelible stains, such as lipstick, hot grease, crayon, ink, require only soap and water for removal. Varlon, Inc., Merchandise Mart, Chicago, Ill.

BUILT-IN BEDS

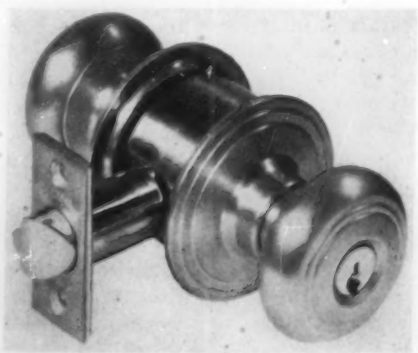
Sleeping-car-type beds for use in the home or for combination bed-sitting rooms in hotels have been perfected so that a simple press of a push button converts a divan into a full-size single bed made up ready for sleeping, while a second button releases an upper bed ready for use. It is reported that by reason of the simplicity of the guest-operated push-button control a number of hotels have ordered sleepers for conversion of ordinary single and double rooms. Arnot and Co., 200 West Saratoga St., Baltimore 1, Md.

COATED ALUMINUM

As the result of a national contest sponsored by the makers, the name *Alumicor* has been given to an aluminum alloy sheet processed under controlled heat and pressure with special bituminous compounds, pulverized slate and mica. It is said to require no painting, to be rust and corrosion proof, and non-electrolytic in contact with steel. Insulating value and the elimination of ordinary condensation are also claimed. The Cheney Metal Products Co., Trenton, N. J.

ALUMINUM HARDWARE

A new line of *Luster-Sealed* aluminum locks has been announced. The manufacturer states they can be installed anywhere with confidence in their ability to resist staining, tarnishing, and the corrosive effects of weathering. Schlage Lock Co., San Francisco, Cal.



Aluminum Building Hardware

FLOORING PRODUCTS

Thermoplastic qualities that enable regular traffic to smooth out surface damages such as cuts and indentations are claimed for a utility type flooring, *Accoflor*, which has just been developed. A mastic composition bonded to an asphalt-saturated felt backing, it is available in black and red, and made in rolls 1 and 2 yd. wide.

The same maker promises for midsummer a new resilient flooring material, *Corolon*, which it is claimed will combine extreme toughness and durability with great flexibility, will resist marring and scuffing; grease and dirt will not penetrate its surface, and it will be highly resistant to water and moisture. Armstrong Cork Co., Lancaster, Pa.

ELECTRONIC FILTERS

Home Electronic Unit

At a press luncheon at the Hotel Waldorf-Astoria on January 30, a home central unit for air purification was demonstrated. Through electronic action

Home Air Purifier

on the air circulated by a warm-air heating system, it is asserted that the *Precipitron* removes 90 per cent of the dust and smoke particles. The unit is compact, and power consumption is said to be equivalent to that used by a 60-watt bulb. Westinghouse Electric and Manufacturing Co., Hyde Park, Boston 36, Mass.

Paper Filters

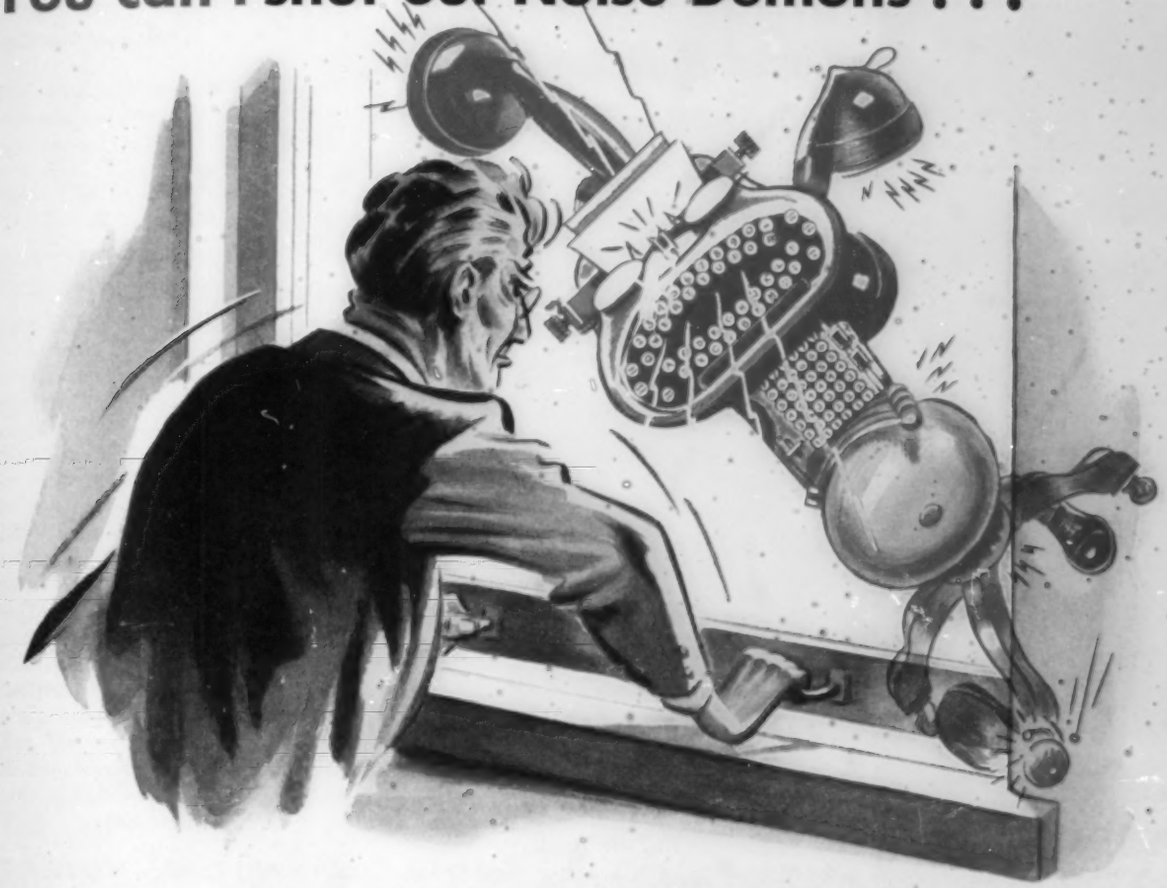
Electrostatically charged paper is used as the filter element in an electronic air purifier, the *Electro-Airmat*. The filter weighs 40 per cent less than electronic filters having metal plate collectors and requires 30 per cent less floor area. When power is off *Airmat*'s mechanical filtering properties prevent infiltration of dust due to "stack effects." American Air Filter Co., 125 Central Ave., Louisville 8, Ky.

SOLARMETER

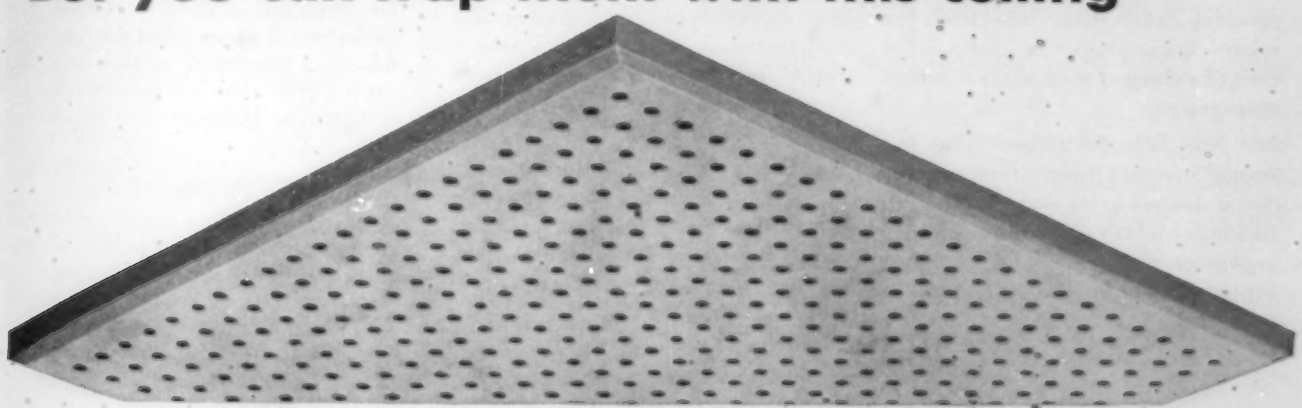
A convenient method for determining the direction and inclination of solar rays at any hour of certain critical dates

(*Continued on page 22*)

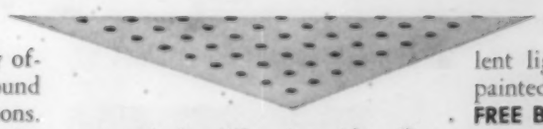
You can't shut out Noise Demons . . .



But you can trap them with this ceiling



It's Armstrong's Cushiontone



YOUR CLIENT'S OFFICE—any office where people work—is bound to be infested with noise demons. These shrill pests breed in the din of clattering machines, jangling bells, and loud voices. They distract attention, rasp nerves, cause errors, generally reduce efficiency.

That's the reason so many architects today are recommending the economical ceiling that rids offices of noise demons. It's called Armstrong's Cushiontone*, and the 484 deep holes in each 12″ square of this fibrous material absorb up to 75% of all noise striking the ceiling. Cushiontone is also an excellent light reflector and can be repainted without loss of efficiency.

FREE BOOKLET, "How to Exterminate Office Noise Demons," gives all the facts. Write for your copy to Armstrong Cork Co., 2403 Stevens St., Lancaster, Penna.

* Reg. U. S. Pat. Off.

MADE BY THE MAKERS OF ARMSTRONG'S LINOLEUM AND ASPHALT TILE

Penetrating Seal-O-San locks out dirt
Seals germ-packed cracks and crevices

IN these days of manpower and material shortages, the architect who specifies Penetrating Seal-O-San for school floors wins the gratitude of everyone charged with efficient school management.

For here is a floor finish that has *proved* in more than 5000 schools that it doesn't break down. And with its longer wear comes easier and inexpensive maintenance, for a floor protected with a Seal-O-San finish *stays clean.*

Penetrating deep, Seal-O-San becomes part of the wood . . . leaves no surface film to chip or crack. Sealing the cells, it forms a protective finish that actually *reinforces* surface fibres. As a result, the rugged, durable seal offers protection not only against scraping feet but also against the damaging effect of ink, chemicals, or water.

Moreover, the tougher Seal-O-San finish keeps dirt from piercing the surface and getting a foothold. It puts an end to hidden crevices that harbor germs or dirt. That's why a Seal-O-San floor stays clean longer . . . why maintenance becomes simple and inexpensive.

Seal-O-San leaves a beautiful, soft-lustre, natural finish—as smooth and polished as a fine piece of furniture. And the ease of application—with lambswool mop — brings worthwhile labor savings.

Your insistence on *beauty, longer wear,* and *simple maintenance* for school floors will inevitably lead you to Seal-O-San. Why not write for specifications and complete details—*today.*

THE HUNTINGTON LABORATORIES INC
DENVER • HUNTINGTON, INDIANA • TORONTO

PENETRATING
SEAL-O-SAN
PERFECT SEAL AND FINISH FOR WOOD FLOORS

FOR BETTER BUILDING

(*Continued from page 20*)

throughout the year has been devised. This *Graphic Solarmeter* is made to cover various zones, so that by placing the proper transparent guide over a plan, proper orientation may be readily determined. R. W. Justic, Box 122-A, Belvedere, Marin Co., Calif.

ADHESION TILING

A new product, *Sparamics*, has been developed, in which ceramic mosaic tiles are mounted face up on plastic for application by direct adhesion setting. The tile-in-plastic sheets are 12 by 24 in. and may be laid in place directly on hard, smooth surfaces to which a thin adhesive has been applied. The maker claims grouting may be done immediately, and areas treated with this material are ready for use with very little delay. Inasmuch as this material adds only about ¼ in. to the wall and floor thickness, and weight is considerably less than the usual tile installations, it lends itself to alteration work and to locations where the weight and thickness of ordinary tiling have previously precluded the use of tile. The Sparta Ceramic Co., 110 East 42nd St., New York 17, N. Y.

AIR FLOW INDICATOR

Readings showing air flow and percentage of maximum flow at all times are obtainable on the new *Flocator*. The indicator will warn against any loss of air flow in a ventilating system thus preventing circulation loss and reducing operating costs. Dollinger Corp., Rochester 3, N. Y.

RUST REMOVER

Rust removal in a matter of seconds with no perceptible etching or discoloration is said to be accomplished with the new *Nox-Rust* rust remover. Articles to be cleaned may be brushed, sprayed or dipped, and even long periods of immersion are said to have no appreciable corrosive effects. Nox-Rust Chemical Corp., Chicago 8, Ill.

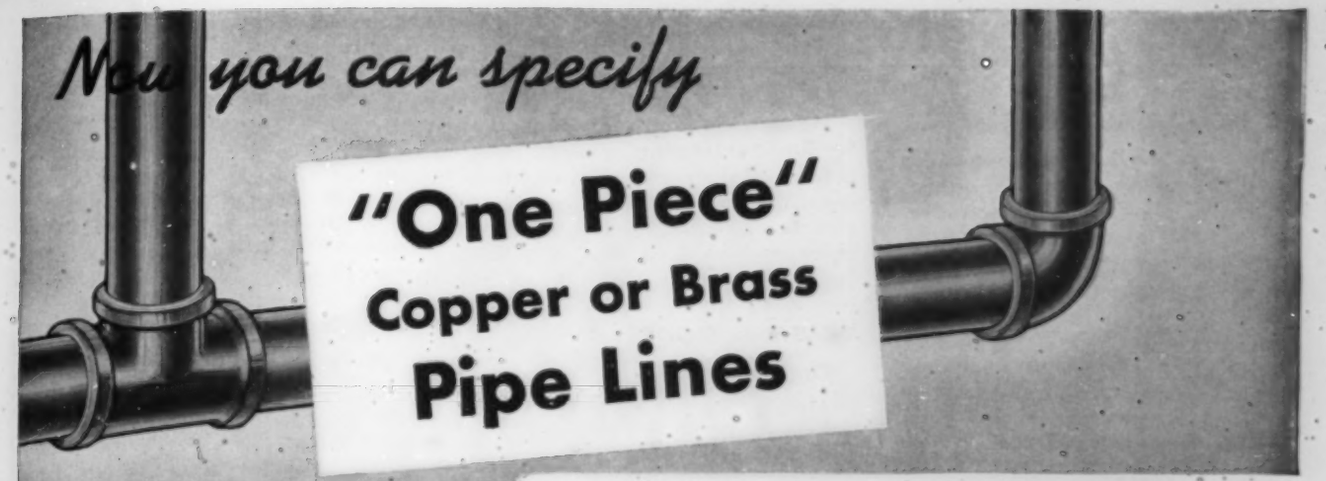
GRAVITY CONVEYORS

A series of gravity roller conveyors has been announced for those who want a limited number of units of simple design for small installations. All units are 10 ft. long, and may be obtained in various widths and curved and straight sections to be used singly or in combination. Lyon Metal Products, Inc., Aurora, Ill.

SAFETY FLUE

A single refractory casting which combines flue entrance, flue liner, a baffle plate to increase draft and prevent soot fires, and a clean-out opening with clo-

(*Continued on page 136*)



Now you can specify

"One Piece" Copper or Brass Pipe Lines

WITH *Silbraz** Joints

WITH THE "SILVER RINGS"

Silbraz Joints—the modern threadless method of joining copper and brass pipe and tubing—provide the nearest approach to the ideal of a one-piece pipe line yet attained.

An insert of silver brazing alloy incorporated in the bore of the fitting or valve is melted by the heat of the oxyacetylene torch and flows out between the pipe wall and bore of the fitting. The brazing alloy which is free flowing at 1300° F readily penetrates the lap area between the pipe and fitting, providing a strong, tight joint.

The result is, in effect, a one-piece pipe line that withstands excessive vibration—even at high temperatures—and the joints exceed the strength of the pipe and fitting.

Bronze fittings and valves for making Silbraz Joints in plumbing and heating lines, gas, fuel and process lines are produced by leading manufacturers and are available in all important centers.

Specify Silbraz Joints to insure fullest satisfaction wherever the plans call for copper or brass pipe or tubing.

*Registered U. S. Pat. Off.

He Can Install "One Piece" Pipe Lines

Better plumbing and heating contractors everywhere, recognizing the advantages of Silbraz Joints, are ready to install them on any job. They have the special Airco oxyacetylene equipment and the skill and knowledge necessary to do the job right.

AIRCO

AIR REDUCTION

General Offices: 60 EAST 42nd STREET, NEW YORK 17, N. Y.

In Texas: MAGNOLIA AIRCO GAS PRODUCTS CO. • General Offices: HOUSTON 1, TEXAS

Offices in all Principal Cities

Represented Internationally by Airco Export Corp.

MANUFACTURER'S LITERATURE

AIR TREATING AND REFRIGERATION

Refrigerating, Ice-Making, and Air Conditioning Equipment. Contains analysis of principles of refrigeration, and problems of various types of installations, together with scale layouts. Gives photographs and drawings of refrigerating units and their components, valves and fittings. Also has many convenient reference tables. Studies include problems of air conditioning system design, refrigerated food lockers and quick-freezing systems. 32 pp., illus. Frick Co., Waynesboro, Pa.

Equipment for Refrigeration and Air Conditioning. A booklet of photographs and descriptions of various types of equipment and installations. Also featured are turbines, pumps and engines. 32 pp., illus. Worthington Pump and Machinery Corp., Harrison, N. J.*

AIRPORT DESIGN AND CONSTRUCTION

Looking Ahead to the Airport Center of Tomorrow. A theoretical conception of the airport of tomorrow serving a number of adjacent communities, yet gathering around itself industrial and residential components of its own. Designed primarily as a study of airport heating, this folder gives much useful information regarding general problems of airport planning. 16 pp., illus. The Ric-Wil Co., Union Commerce Bldg., Cleveland, Ohio.*

ELECTRICAL SERVICE

Handbook of Residential Wiring Design. The single family dwelling is analyzed room by room for electrical needs, and recommendations made for layout of circuits and outlets. 24 pp., illus. Industry Comm. on Interior Wiring Design, Room 2650, 420 Lexington Ave., New York, N. Y., 25 cents.

FIREPLACES

Your Fireplace. Manual of fireplace design and construction, both conventional and employing air circulators. Outdoor fireplaces are also considered. Catalog of fireplace accessories. 30 pp., illus. The Majestic Co., Huntington, Ind. 25 cents.*

HEATING

Ratings and Installation Guide for Burnham Base-Ray. Booklet containing rating tables, descriptions of fittings and installation details for radiant-baseboard heating. 12 pp., illus. Burnham Boiler Corp., Irvington, N. Y.*

How to Handle Heat Generation for Radiant Heating Systems. Photographs and description of typical boiler installation for panel heating, with explanation of various features and principles involved. 4 pp., illus. The H. B. Smith Co., Inc., Westfield, Mass.*

INDUSTRIAL FLOORS

Concrete Floors. Describes methods and procedure for placing heavy-duty wearing course on new jobs and for resurfacing, old floors. Demonstrates how by use of 24-hour cement, worn-out floors may be replaced over a single weekend. Lone Star Cement Corp., 342 Madison Ave., New York 17, N.Y.

INSULATION

B-H No. 1 Insulating Cement. Application methods and recommendations. Chart shows performance rating. Includes tables giving coverage on various types of fittings. 4 pp., illus. Baldwin-Hill Co., 564 Klagg Ave., Trenton 2, N. J.*

Performance. Insulating study of a small house design, complete with heat loss data table. Considers also fire-retarding properties of mineral wool insulation. 4 pp., illus. The National Mineral Wool Assn., 1270 Sixth Ave., New York, N. Y.

LIGHTING

Ceilings Unlimited. Handbook of construction and design details for fluorescent troffer lighting combined with hung furred ceilings. Catalog of fixtures including illumination performance tables for various size room areas. Brochure contains scale drawings of troffers, hangers, connectors, and plates, channels and reflectors. 24 pp., illus. The Miller Co., Meriden, Conn.

PIPE FITTINGS

How to Cash in on the Silver Alloy Ring. Description of the *Silbraz* method of joining valves and fittings without threading. Typical installations of brazed-joint piping are shown. Air Reduction, 60 East 42nd St., New York 17, N. Y.

PLYWOOD

Weldwood Plywood for Commercial Interiors. New installations of plywood in various commercial interiors are described and illustrated. Explains effects to be secured by choice of woods and finishes. 20 pp., illus. U. S. Plywood Corp., 55 West 44th St., New York.*

REINFORCED CONCRETE

Modern Developments in Reinforced Concrete — No. 15. Analysis of the use of precast concrete building frames, their design, and modifications. Gives study of use of precast concrete slabs in bridge construction. 16 pp., illus. Structural Bureau, Portland Cement Assn., 33 West Grand Ave., Chicago 10, Ill.*

ROOFING

Asbesto Cold Process Built-up Roof. Specification sheets covering method of application of various types of built-up roofs. 8 pp., illus. Abesto Manufacturing Co., Michigan City, Inc.

Batten Type Roofs. Construction details and flashing of copper batten type roofs. 6 pp., illus. Copper & Brass Research Assn., 420 Lexington Ave., New York, N. Y.

TESTS AND INSPECTIONS

Services of Pittsburgh Testing Laboratory. This brochure outlines facilities for testing of materials at the laboratory, as well as field inspection service for checking buildings and materials during construction. 28 pp., illus. Pittsburgh Testing Laboratory, Pittsburgh, Pa.*

* *Other product information in Sweet's File, 1945.*

LITERATURE REQUESTED

The following individuals and firms request manufacturers' literature:

Allied Planners, Architects and Industrial Designers, 1611 Sansom St., Philadelphia 3, Penn.

David C. Boswell, Consulting Engineer, Ridgefield Park, N. J.

Ray R. Brown, 819 Windham Ave., Cincinnati, Ohio.

G. Mallory Collins, Architect, Highland Park Village, Dallas, Texas.

S. H. Crochet, Architect and Engineer, 1624 Gen. Taylor St., New Orleans, La.

Louis P. Hatkoff, Architect, 356 W. 22nd St., New York, N. Y.

Jones & Hunter, Architects, 2049 Broadway, Boulder, Colo.

Lt. Com. Paul E. Kohler, Jr., Architect, 253 Worth Ave., Palm Beach, Fla.

Jack Martin, Fort Pitt Fixture Co., 2056 W. Liberty Ave., Pittsburgh, Penn.

Henry L. Mikolajczyk, R.A., 1737 W. Division St., Chicago 22, Ill.

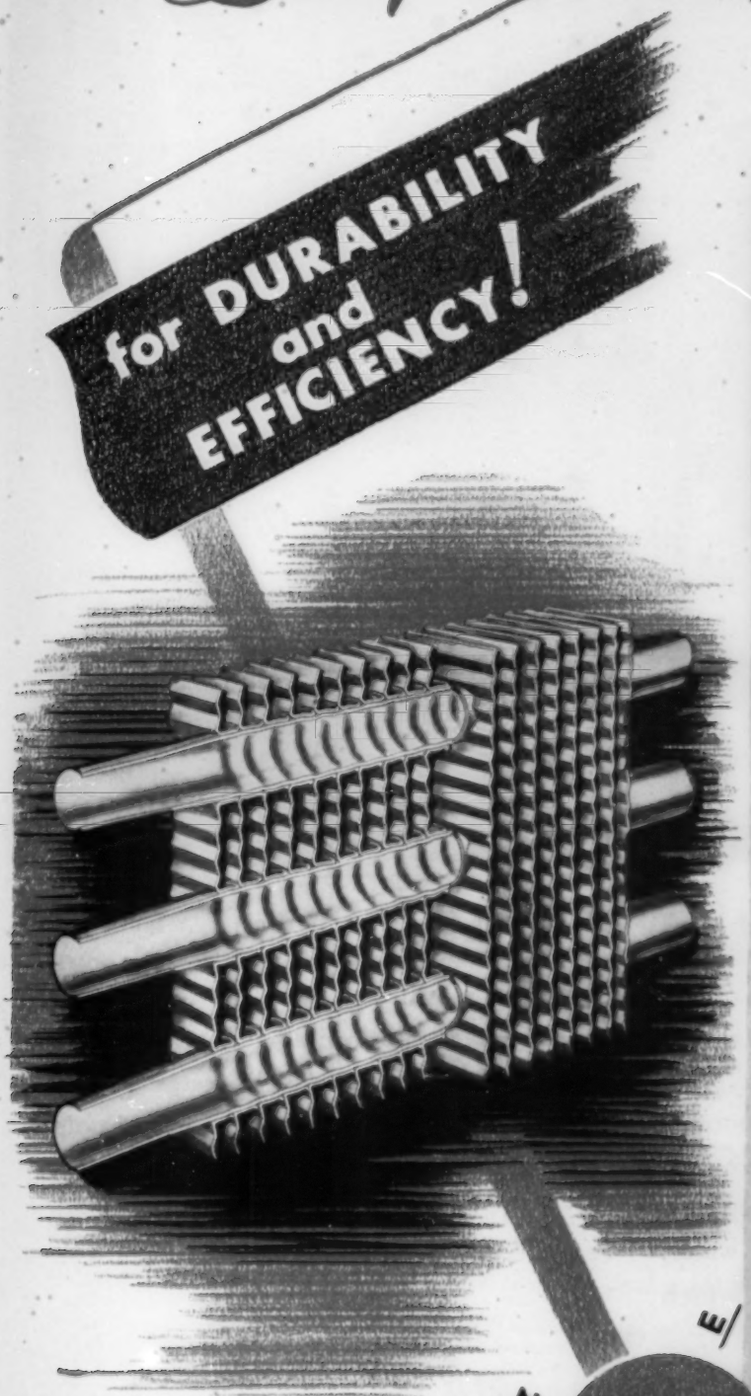
Washington Reed, Jr., Architect, "North Wales," Warrenton, Va.

B. Robert Swartburg, Architect, 627 Lincoln Road, Miami Beach 39, Fla.

John H. Truluck, Jr., Architect, Press and Standard Bldg., Walterboro, S. C.

Milton B. Weissman, A.I.A., 164 Montague St., Brooklyn 2, N. Y.

McQuay RIPPLE FIN COILS



ONLY McQuay gives you Ripple Fin coils and only Ripple Fin coils give you top performance. Look at these distinct advantages:

•

Ripple Fin coils have higher flexible strength with less air friction and cleaner operation.

•

Ripple Fin coils have greater heat transfer surface.

•

Hydraulic expansion of all tubes into fins having wide collars provides permanent mechanical bond.

•

Copper headers have strongest construction because of inherent flexibility to accomodate unequal contraction and expansion.

•

McQuay coils are proved and preferred — proved by service under the most rigid conditions and preferred because of their exclusive construction.

•

McQuay coils are available in a wide variety of styles and sizes, both standard and special coils for steam, hot water, cold water, brine, direct expansion and other applications. For complete information write McQuay Inc., 1600 Broadway Street Northeast, Minneapolis 13, Minnesota. Representatives in all principal cities.

•

N E W S

MAKE THE SEASONS COME TO YOU

McQuay INC.

AIR TEMPERING EQUIPMENT ESPECIALLY DESIGNED FOR INDUSTRY. . . .

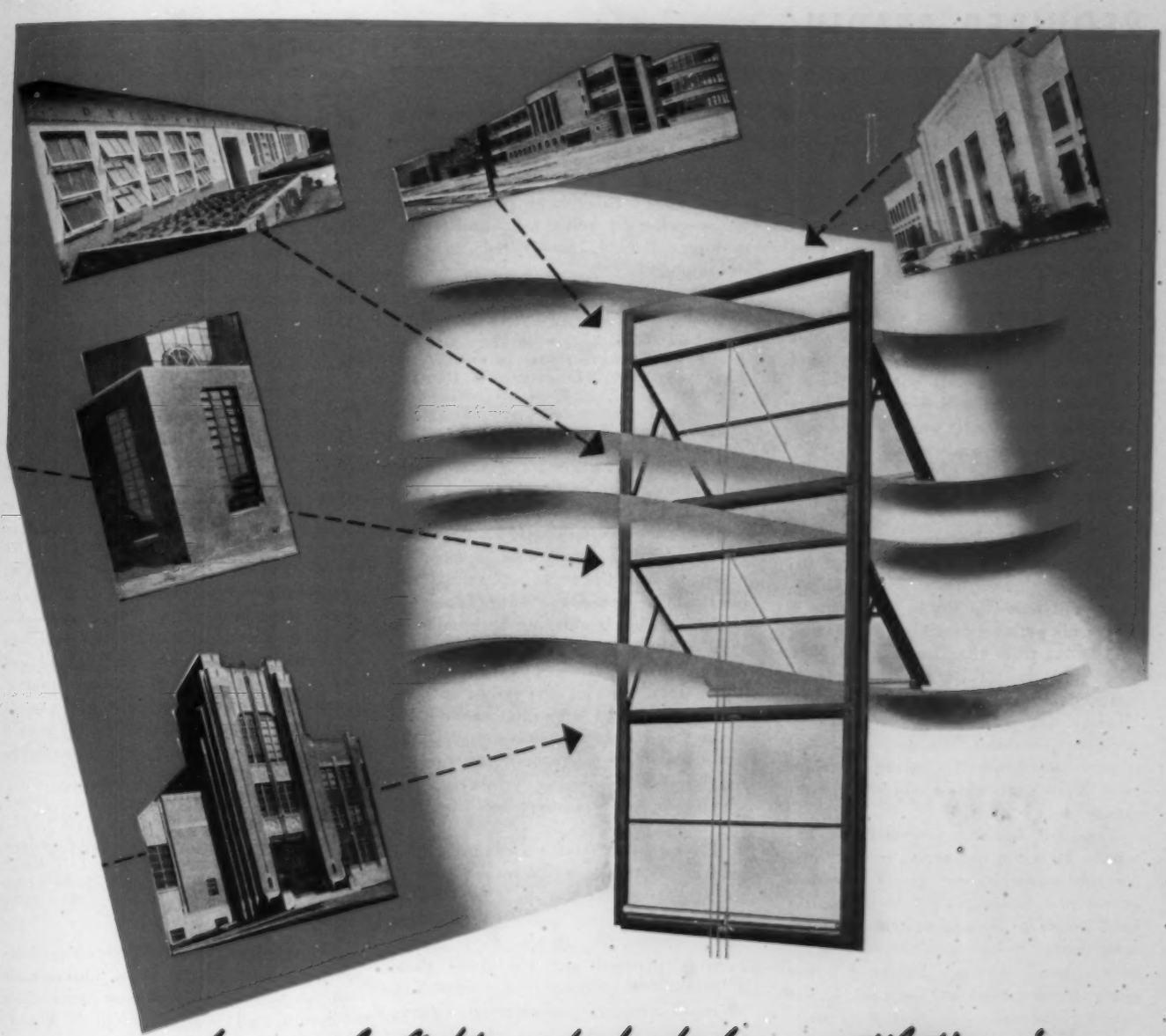
ARKETEX FOR *Studied Style*

THIS ceramic glazed structural tile, available in many sizes, colors, and textures, has been perfected to allow endless flexibility in design. Years of patient effort have developed a building material that is durable, economical, and completely modern. Arketex is a permanent wall and finish all in one — a wall which is not affected by steam, water, ink, or the action of acid; a finish which won't mar, scar, crack or craze. Only soap and water washing is required to maintain its luster. No periodic painting or refinishing is necessary — with Arketex *the first cost is the only cost!* In planning schools, hospitals, theatres, or stores, be in style with Arketex — first with the finest in ceramic glazed structural tile!

A Peacetime Promise

Arketex' continuous achievement in the ceramic glazed structural tile field assures you the finest in workmanship. Arketex — the standard of textured tile.

ARKETEX CERAMIC CORPORATION • BRAZIL, INDIANA



for ample light and draft-free ventilation in a wide range of structures . . .

The Donovan Awning Type Window offers the architect a wide range of opportunities for design distinction in window areas in schools, hospitals, auditoriums, and similar structures.

—and assures for these buildings unique advantages in lighting and conveniently controlled ventilation.

The Donovan design completely eliminates all unsightly exposed connecting arms, shafts, racks, etc. The awning principle of the open ventilators permits a free flow of air in inclement weather. Fully opened, the windows afford approximately 100% ventilation. Ventilators operate in unison, either by manual control or completely concealed mechanical operators, as desired. In manual operation the opening of the sill ventilator automatically and simultaneously opens all other vents, however by means of a special automatic disengaging mechanism, the upper ventilators may be left open and the lower ventilator closed.

Write for illustrated manual giving complete mechanical details of the Truscon Donovan Awning Type Steel Window.

TRUSCON STEEL COMPANY

YOUNGSTOWN 1, OHIO • Subsidiary of Republic Steel Corporation

Manufacturers of a Complete Line of Steel Windows and Mechanical Operators . . . Steel Joists . . . Metal Lath . . . Steeldeck Roofs . . . Reinforcing Steel . . . Industrial and Hangar Steel Doors . . . Bank Vault Reinforcing . . . Floodlight Towers . . . Bridge Floors.

REQUIRED READING

CITY PLANNING

New Cities for Old — City Building in Terms of Space, Time and Money. By Louis Justement. New York 18 (330 W. 42nd St.), McGraw-Hill Book Co., Inc., 1946. 7 by 10 in. 232 pp. illus. $4.50.

Louis Justement by profession is an architect; by inclination, to judge from this book, he is an economist — and a very competent one. For this study of city planning is concerned primarily not with layout schemes, slum clearance and housing programs, but with common-sense economic approaches to complete rebuilding of cities. It offers a thorough and *possible* program which by its very nature refutes the innumerable arguments that the slums must always be with us.

Kernel of Mr. Justement's scheme is his retirement plan for buildings. Instead of the currently predominant 99-year land lease he would substitute a 50-year lease; every building would run the gamut from the "luxury" category when new, down through "good" classification and medium-priced rents, to the "bad" rating which would immediately precede demolition. By being able to require demolition of a building as soon as it is 50 years old, a city would constantly renew itself.

Take his housing proposal, for example. It is not necessary, he suggests, for the lowest income groups to have brand new housing — all they need is *good* housing. He recommends a city-wide census to ascertain the percentage of vacancies existing. Taking a 5 per cent vacancy ratio as the goal, if the existing vacancies top that percentage he would have a proportionate amount of the worst housing immediately demolished, the de-housed families moving into better quarters with a government subsidy making up the difference in rent. New houses would be built in the luxury and medium-priced classifications. By consistent demolition of all very bad and bad housing, after a while only good housing would be left, Mr. Justement ayers. Only enough new housing would be built to maintain the 5 per cent vacancy ratio in conjunction with demolition of substandard housing.

As a case study in city planning, Mr. Justement offers Washington, D. C. A series of plates illustrates the development of the city from L'Enfant's original plan in 1791 to the present, and indicates the trends of the future.

A tremendous amount of research and careful thinking has gone into the preparation of this book. Every argument is based on sound realism and is realistically presented. Whether or not he agrees with all that Mr. Justement says, the thoughtful reader will find himself stimulated by a concept of city planning that is first of all economically possible. Here is no plea for a Utopia which never can be reached, but a plea instead for a cessation of piecemeal planning, of patchwork-quilt rebuilding, and a beginning of bold, far-sighted, over-all development.

METROPOLIS A-MARCH

New York Advancing. Seven More Years of Progressive Administration in the City of New York, 1939–1945. Rebecca B. Rankin, ed. New York 7 (2230 Municipal Bldg.), Municipal Reference Library, 1945. 5½ by 8½ in. xxxvi + 394 pp. illus. $1.00.

This third edition of "New York Advancing" is in reality the swan song of New York's colorful and bombastic little ex-mayor Fiorello H. La Guardia. And a stirring swan song it is. The extent to which the city's physical face has been lifted under the "Little Flower's" administration is amazing, especially in view of the cessation of public building during the war years. Those inventions of the devil, the elevated railways, have to a great extent been eliminated; new squares and parks have blossomed forth; parkways have been built; new civic buildings and housing projects have sprung up; airports have risen from the salt marshes of Queens.

But all of that is water under the bridge. Of more importance today is the $1,270,000,000 Postwar Public Works Program developed under La Guardia, the $120,000,000 of low rent public housing planned and the more than $100,000,000 medium rent partial tax exemption houses programmed. Everything from hospitals and airports to a huge new wholesale market and a freight terminal are on the books for early construction. And an over-all master plan for the city is in the works. La Guardia can well be proud of his administration's achievements.

CAPITAL LEAVES

The Leaves of Southwell. By Nikolaus Pevsner. New York (245 Fifth Ave.), Penguin Books, Inc., 1945. 4 ¾ by 7 in. 72 pp., 32 plates.

A book, no matter how small, devoted exclusively to the foliage decorations of a 13th Century chapter house might seem at first thought to be so limited in scope as to be of little interest. But this tiny volume by a lecturer in the history of art at Birbeck College, University of London, will be of considerable interest to any student of art or architecture. For the chapter house of Southwell Minster is characterized by "a beauty of foliage decoration unparalleled in 13th Century chapter houses," Mr. Pevsner says. "You find the leaves of Southwell, fresh and resilient, lustily spreading all over the capitals of the 45 columns which separate the seats, all over the tympana, crockets and finials of the gables above the seats, all over the vaulting shafts and bosses of the roof, all over the capitals and voussoirs of the double archway leading from the chapter house into the passage, and that from the passage into the choir, and all over the capitals of the 49 little columns along the west side of the passage and its originally open east side." Even a casual glance at the plates bears out Mr. Pevsner's claim that the Southwell leaves are exceptionally un-stylized; the oak leaf is instantly recognizable as an oak leaf, and the maple as a maple. This fidelity to nature, even more than the abundance of the foliage decoration, sets the Southwell chapter house apart. Who the architect was, who the sculptor was, no one knows, but each was a true master of his art.

Mr. Pevsner's book is not limited to a mere description and analysis of Southwell; it includes also a generous comparison of Southwell with other churches and chapter houses both in England and on the continent. The many photographs, by F. L. Attenborough, principal of University College, Leicester, add much to the value of a thoroughly interesting study.

SANATORIUM

Tuberculosis Hospital — 200 Bed Capacity. A portfolio of plans prepared by J. B. Basil, consulting architect. New York (1790 Broadway), Natl. Tuberculosis Assn., 1945. 11 by 14 in. 10 pp. $2.50.

These plans for a 200-bed tuberculosis hospital are based on a nation-wide survey by the Committee on Sanatorium Planning and Construction of the American Trudeau Society, Medical Section, National Tuberculosis Association. Included are a plot plan and five detailed floor plans. An introduction traces the historical evolution of the sanatorium from the cottage through the central living room and porch stage to the modern centralized hospital. The current medical views on the treatment of tuberculosis and the needs of medical services are discussed, and pertinent data furnished on laboratory and administration facilities, service requirements and staff residency needs.

HOSPITALS

1945 Hospital Review. Chicago 10 (18 E. Division St.), American Hospital Assn., 1945. Vol. I, The Individual Hospital; Vol. II, The Future of the American Hospital System. 8 by 10¾ in. 78 and 64 pp. 25¢ ea.

In place of its annual convention, the American Hospital Association this year compiled the "1945 Hospital Review," a series of three booklets on hospital problems and purposes, the third of

(*Continued on page 156*)

ARCHITECTURAL

RECORD

A COMPETITION FOR THE WORLD'S CAPITAL

THE FIRST stage in designing the UNO capital is nearing completion. A site has been recommended by the committee which has spent weeks inspecting probable and proffered areas. Final selection accepting the committee's recommendation of the Westchester-Connecticut area has been made by the vote of the General Assembly of UNO. The size, shape, location and extent of the site will be studied soon by a new planning commission, and site conditions and potentialities are prime factors in the designing of the new capital.

The method of selecting the architects and planners who will develop the site should be decided without delay. To insure a final plan that will function efficiently, permit growth, and create an atmosphere in harmony with the high purposes of United Nations is no mean task. The best possible talent must be brought to bear. To select this talent impartially, an anonymous design-competition seems essential.

The success of such a competition, or competitions, will depend on three things:

1. The formulation of the *competition program*, which will be specific regarding objectives and required facilities, yet free enough to permit full scope for creative imagination.
2. The inspiration and creative abilities of the *competitors*. Both an "open" and an "invited" competition could bring out both recognized and undiscovered genius.
3. The vision, knowledge, and intellectual integrity of *the jury*. The selection of a competent jury is of the utmost importance, for only by the exercise of informed, unprejudiced, imaginative judgment can the best design be chosen. The competitors themselves might well have a voice in the selection of some of the jurors to insure the complete understanding and clear interpretation of the designs submitted.

The knowledge, experience, and facilities of the A.I.A., the R.I.B.A., and the professional organizations of UNO countries should be made available at once to formulate the method of selection of the groups who will design and execute the project. Immediate action on the part of architects both here and abroad is necessary to insure a world capital that will contribute physically and spiritually to World Peace.

Kenneth K. Stowell

EDITOR

CHICAGO TACKLES ITS BUILDING CODE

. . . and the Pierce Foundation study makes specific recommendations for positive action to make Chicago's code a model of efficiency

CHICAGO wants more and better buildings! It knows that building regulations can and do affect, positively or negatively, the number, kinds, and costs of buildings. Is Chicago's present legislation encouraging large building programs or hampering development? Does it raise costs or permit the most efficient and economical construction? What can and should be done about it? Chicago's Association of Commerce decided it was high time to find the answers. Here's how—and what.

This need for a really comprehensive re-examination of Chicago's building regulation logically moved the Association to sponsor a thorough-going "pilot study" of all the city's building legislation. To insure an absolutely objective and technically competent fact-finding study and analysis, the Association commissioned the John B. Pierce Foundation of New York to undertake the work under the direction of Howard P. Vermilya, its Director of Housing Research. To supplement its own staff, the Foundation engaged Skidmore, Owings, and Merrill, architects and engineers, and others, including lawyers Walter V. Schaefer and his associate Alex Elson of Northwestern University Law School.

While intended to survey the whole field of building legislation, the limitations of the undertaking required careful selection of subject matter and careful attention to emphasis. The conclusions suggest a broad plan of action and further inquiry rather than specific proposals for detailed revisions in existing laws.

The material to be examined fell logically into two main divisions: legal phases of the subject and technical considerations. At the initiation of the study, no assumptions were made as to the merits or demerits of existing building legislation. Recommendations were developed from a study of the legal and technical facts as they exist in Illinois and Chicago; from a study of the law of other jurisdictions; from an analysis of so-called model laws; from a consideration of existing and proposed standards of recognized scientific and building organizations; and from the works of recognized authorities in the respective fields examined.

In addition to conferences and consultations with experts and interested parties a questionnaire was sent to authorities in approximately thirty cities, having building regulation problems of the scope and character of those in Chicago.

The results of this thorough study and analysis are incorporated in a published report which makes definite recommendations for further action—recommendations worthy of study by all who are vitally interested in the efficiency and effectiveness of the building industry.

WIDE WORLD Photo

SUMMARY OF RECOMMENDATIONS

The recommendations developing from this limited study of Building Regulation in Chicago must necessarily be general in their nature. They should serve as objectives in charting the course of future action. In their most simplified form, these Recommendations suggest that Building Legislation in Chicago be redrafted to provide,

1. The basic regulation, pertaining to safety and health in a manner which will secure simplification, flexibility and coordination of building requirements.
2. The consolidation of administration of building regulation in one agency so as to make possible greater efficiency, lower operating cost and unified administrative responsibility.
3. Delegation, with proper safeguards, to the Administrative agency of power to adequately interpret building legislation so as to obtain greater flexibility to meet changing conditions.

A. Standards to Provide Flexibility and Growth Should Be Based on Functional Requirements Insofar as Possible. Where it is not possible to establish standards on a performance basis, they should be established on a factual design basis so as to establish a method of measurement with which to compare performance. These design standards also should be a part of the code to be approved by the City Council. The standards established by the City Council should be supplemented by rules and

regulations adopted by the administrative agency in the form of descriptive good practice requirements.

B. **Building Regulation Should Be Coordinated With Land Use Regulation** to aid the development of the Comprehensive City Plan of Chicago. The most significant sections of the regulations are those on natural light and ventilation, on distance between buildings and to property lines, on the establishment of fire districts and on frontage consents.

C. **Progress Recognized in War Housing Regulations Should Be Preserved** to maintain the raised level of standards now established.

D. **Administrative Control of Building Regulation Should Be Merged** to achieve uniform administrative control, to simplify and strengthen enforcement and to reduce costs of administration. The City Council should establish in one administrative agency all the functions concerned with the regulation of the construction, alteration and maintenance of buildings and their equipment. The City Council should also develop a coordinated system of permits, inspections and certificates to avoid duplication insofar as possible and to facilitate enforcement.

E. **An Administrative Organization Should Be Established so as to Carry Out the Objectives of Building Regulation:**

1. A Building Department should be established under the administrative supervision of the Building Commissioner whose duties shall be:
   a. To enforce the Building Code.
   b. To interpret the Code and the Rules and Regulations by formal action on application and in specific cases only.
   c. To propose to the Board of Building Standards modifications in the Code and in the Rules and Regulations which he deems appropriate.
2. A Board of Building Standards should be established with a full-time compensated professional staff whose functions should be:
   a. To have tested all new materials and methods of construction to ascertain compliance with the standards of the building code.
   b. To formulate all rules and regulations, including the adoption of standards of good practice by reference, interpreting and supplementing the functional standards established by the City Council.
   c. To propose to the City Council such amendments to the Code as are deemed necessary and to take formal action on recommendations of the Building Commissioner for amendments of the Code or modification of the Rules and Regulations.

   All rulings . . . should be . . . subject to public hearings at which all interested parties may present their views. These rulings should be published and filed with the City Council.
3. A Board of Appeals should be established . . . with a full-time compensated professional staff whose functions it shall be:
   a. To review an appeal:
      (1) Decisions, rulings, and interpretations of the Building Commissioner.
      (2) Rules and Regulations formulated by the Board of Building Standards.
   b. To act upon:
      (1) Applications for variances from the Code and Rules and Regulations.
      (2) Applications for variances from the zoning ordinance.

   It should be required by the City Council that all decisions of the Board of Appeals be based on written findings of fact in accordance with criteria established in the legislation.
4. Judicial review of all decisions of the Board of Appeals should be provided.
5. A publication should be initiated which will contain all formal decisions, rules and regulations, interpretations and a calendar of all scheduled hearings of the Building Commissioner, the Board of Building Standards and the Board of Appeals.

F. **Administrative Body Should Be Appointed to Accomplish the Objectives of the Recommendations of this Study.** The Mayor should be authorized by the City Council to appoint a Board of Building Regulation to serve only for the time required to accomplish these purposes. The Board should be composed of seven outstanding citizens noted for their interest in the general welfare and future development of Chicago, who should serve without compensation. The Board should be empowered to select an Advisory Council to serve without compensation. The Council should adequately represent the various groups and associations whose activities are directly affected by building regulation. The Board should be granted an appropriation necessary to carry on its duties. The Board should also be authorized by the City Council to employ, with the approval of the Mayor, an Executive Director who shall be qualified to organize and direct a staff capable of carrying out for the Board of Building Regulation the duties outlined below:

1. To consult with the Board of Building Regulation in the development of a program for the accomplishment of the recommendations resulting from this study.
2. To prepare and present to the Board of Building Regulation for its approval proposed legislation for submission to the City Council.
3. To prepare and present to the Board of Building Regulation for its approval the initial Rules and Regulations, interpreting and supplementing the standards contained in the legislation, for adoption by the Board of Standards when created.
4. To conduct such studies as the Board of Building Regulation may decide are desirable.

G. **Other Related Problems Require Study.**

1. Restrictive practices in the building industry.
2. Licensing.
3. Local autonomy in building regulation.
4. Building regulation in the metropolitan area.

A NEW PATTERN FOR BUILDING LEGISLATION

By *Howard Vermilya*
Director of Housing Research
John B. Pierce Foundation

1. A POSITIVE CONCEPTION OF CODES

It is not enough merely to revise the details of the 2000 building codes in force throughout the country. We need a new pattern in the codes themselves, a broader conception of the objective of building legislation. Regulations, as they stand today, are largely aggregations of restrictive measures adopted over the years as the evolving history of construction revealed potentialities for disaster and epidemic. They began in colonial times with the regulation of chimneys. Fresh impetus to additional restriction of construction was given as recently as the Coconut Grove holocaust. Codes have been considered, therefore, as negative prohibitions. As a result, they tend to preserve the *status quo* in construction. They make it more profitable for the construction industry to adhere to more expensive, less economical methods. They have not been conceived as positive encouragement to experimentation, development and growth within the standards of safety and health which the community sets for itself.

It is possible to take a positive attitude toward the problem of building legislation. The basis for it lies in the re-consideration of codes from the point of view of today's standards, and of the contribution which the construction industry could make to the community if it were not hampered by unintelligent restrictions. The building industry can be expected to make the same kind of progress as, for example, the aviation industry, when it is encouraged to embark in new directions. But like the aviation industry, it must have freedom to provide better products at lower costs while adhering to necessary standards. It will have such incentives only when regulation is conceived as permissive of all developments meeting standards.

For the public, such a conception of codes opens up the possibilities for:

1. the benefits of a scientific, rather than a political, approach to the objective of better construction
2. flexibility leading to the development of more modern and more economic and speedier construction methods.

For the architect, this means:

1. increased volume of construction
2. greater freedom of design
3. less energy consumed in determining what is permitted by building regulations.

For the manufacturer, it means:

1. larger potential volume
2. more normal marketing procedures and
3. ability to estimate more readily the value of new developments.

Building legislation as now formulated tends to hamper production and increase construction costs principally in three ways:

1. by specifying requirements higher than necessary for safety and health, thereby requiring the use of more material, more expensive material or costlier methods.

An example of this is the common requirement for ceiling heights, ranging from 8′ 0″ to 9′ 0″ as a minimum standard for habitable rooms. Assuming the recommended minimum of 7′ 6″ of the American Standards Association to be sound, these requirements serve to raise construction costs unnecessarily. There are any number of cases where one city specifies standards 100 per cent higher than others, although the problem in each case is similar. A study of 80 codes showed that minimum requirements for live loads for floors in dwelling units varied from 40 to 100 lb. per square foot.

2. by restrictive specifications which prohibit the use of adequate alternate materials and methods, thereby creating monopolistic conditions with attendant increases in cost.

The Chicago Building Code, for example, requires lath and plaster for all dwellings for fire resistance and for sanitation. Analysis of this requirement indicates that it is not only highly restrictive but actually ineffective in accomplishing the protection to health on which it is based.

3. as a deterrent to orderly development and marketing of materials and methods because of the difficulty of meeting the diverse requirements of 2000 building codes.

Every manufacturer has faced this problem in marketing a new product in the construction field. Since building codes tend to specify what has been done and these specifications differ from locality to locality, they actually inhibit development of national markets and serve to increase distribution cost. It would have been analogous in the development of the automobile if there had been 2000 municipal safety officers writing requirements on the cars we use.

To the degree that building legislation produces these results by accident or intent, it is abusing the basic objectives of building regulation and serving special interests rather than the interests of the people. To accomplish the proper purpose of governmental regulation, building regulation cannot prohibit the use of materials and methods of construction which are equivalent or even superior to specified materials and methods. Since building legislation affects the future growth of a community, regulations must be written and administered to permit sound construction at minimum costs.

2. THE NEED FOR CODE CHANGES

In general, the standards in many codes, if not actually outdated, are questionable in light of present technical research. Many code provisions tend to freeze the use of traditional methods, and favor particular types of conventional construction.

For the industry to operate at optimum efficiency in the provision of lower costs and better construction, building regulation must be governed by three principles:

1. an adequate level of standards based on sound principles of safety
2. regulations designed, not to increase cost of construction beyond its natural economic plane, but to permit the use of all methods and materials which meet standards
3. a more uniform concept of standards, to give users the benefits of modern industrial processes applied to the mass production of construction materials.

Requirements too low

Building legislation has been criticized because its requirements are too low and, therefore, society pays dearly through increased costs of police and fire protection and through loss of health and life because of inadequate protection. Recent technical studies give cause for seriously questioning many of the fire protection practices generally accepted for the past twenty years. It is probable that this engineering research will result in the re-appraisal of all fire requirements on the basis of the *combustible contents* of the contemplated occupancy.

Chicago in 1820 needed no Building Code

More specifically, in the case of the Chicago Code, fire escapes are not only generally accepted as a required means of egress, but in some instances are weighted above an interior stairway. At the same time, the Building Exit Code (1942) of the National Fire Protection Association states that:

> *"Outside stairs (fire escapes) may be used as required means of exit only in existing buildings not exceeding six stories or seventy feet in height, subject to the provisions of the occupancy section applying. Outside stairs shall not constitute more than 50 per cent of the required exit capacity in any case. Outside stairs (fire escapes) shall not be used on new buildings.*
>
> "NOTE: *Outside stairs or fire escapes are regarded as at best only an expedient permitted to remedy deficiencies in the exit capacity of existing buildings where conditions do not justify the expense of providing additional inside stairways.*
>
> *"The outside stairs specified by this code are far superior to the ordinary fire escapes which are commonly found on existing buildings. These utterly inadequate, flimsy, precipitous fire escapes, unshielded against fire in the structure to which they are attached, are positively a menace because they give a false sense of security. Such escapes are not recognized by this code as exits."*

Requirements too high

While some requirements of particular building codes may be criticized as being too low, others may be called too high, unnecessarily increasing the cost of construction in the community. In the ordinary dwelling, for example, increasing the thickness of a foundation wall from 8 to 12 inches adds 15 per cent to the foundation cost; increasing floor design loads from 40 to 60 lbs. per square foot adds 30 per cent to the cost of floors; increasing ceiling heights by a foot adds approximately 11 per cent to the cost of exterior walls.

Numerous examples of requirements which are too high or too low, often in the same code, can be found. In fact, it is obvious from the study of codes that there is no common concept of the level of standards which is

necessary to health and safety. A case in point is presented by the varied requirements for the working stress for structural grade steel. The ASA, Pacific Coast Building Officials, National Board of Fire Underwriters and such cities as Boston, Cincinnati and Minneapolis permit 20,000 lb. per square inch while Detroit and New York allow only 18,000, and Chicago permits 24,000. Where one city allows 33 per cent more working stress than another for a product with such known properties as structural steel, is there any wonder that the over-all picture is one of confusion?

It is apparent that there must be much broader agreement on standards and requirements. The growth of the industry on regional and national, rather than on a local, basis, is discouraged by the diffuse pattern of regulation. Development and marketing of new materials and methods are inhibited by confusion of building legislation; use of methods and materials which have been tested during the war but which depart from traditional practice are hampered by obsolete regulation. At the very time when the construction industry might take its greatest steps forward in fulfilling the pent-up need with progressive methods, it finds itself hampered, rather than encouraged, by legislation.

3. THE PROBLEM OF CODE PREPARATION

It is understandable that there is no uniform pattern in our codes: historically, building regulation came about to answer the need for control of local conditions. It was only with the economic integration of our country that regulation became a matter of interest not only to individual communities but also to states and entire regions. Moreover, as suppliers of materials became national in scope, local code regulations began to have their influence on national economics. It is because building legislation is now a national problem that we must have a sound understanding of the principles of regulation in order to arrive at a new pattern of control.

The basic objectives of building regulation (safety to life and the protection of health) are codified by establishing in legislation the requirements which control the construction, alteration, use and maintenance of buildings and the installation and maintenance of equipment. The determination of the level of the requirements to be established as an expression of the will of the community is the major legislative function. A parallel problem is the determination of the manner in which the requirements are to be formulated.

The second important function of the legislature is the establishment of the administrative agency or agencies and the grant of power to effectuate the aims, intents and purposes of the legislation. Here the framework within which the requirements are interpreted and enforced is provided. Legislation when in detail is inevitably prolix. In the field of building construction and maintenance, it is technical and in a large degree beyond

Old Fort Dearborn in its later years

the ken of the layman. Many important requirements are expressed as engineering formulae which are incomprehensible except to the technician.

Obviously, a legislative body is incapable of preparing the legislation in detail itself. Naturally it must, therefore, request others to draft building requirements in the legislation which it finally enacts. Practice in drafting building legislation has varied. Sometimes it is drafted by the administrative agency which will enforce the legislation. Sometimes paid consultants are employed. Sometimes committees of private citizens, usually uncompensated, are established for this purpose. Often it is drafted by a Commission appointed by the Mayor as a coordinating body representing the various interests in the field of building construction, alteration and maintenance. The product thus derived receives legislative sanction by action of the municipal legislature.

In fact, this process is similar to a delegation of power on the part of the legislature. The legislature thereby becomes a court of review. The evidence presented at the hearings on the proposed legislation is relied on to develop the points at issue. To this extent, recognizing their lack of technical knowledge, members of the legislature protect the community and implement its policy concerning safety, health and welfare in building legislation.

The field of building regulation is becoming more and more broad. Today there are some thirteen major classifications under which building is regulated. These include fire resistance and prevention, engineering design, general structural considerations, electrical installations, health regulations, sanitation, including water supply and drainage systems, equipment, including such devices as elevators, heating, natural and artificial lighting, natural and mechanical ventilation, use, planning and zoning.

In the past, legislatures have been obliged, because of lack of data, to determine the level of standards prescribed by the requirements on the basis of opinion and judgment. Often prejudice and limited experience resulted in great discrepancies in the adequacy of the requirements, some being too high and others too low.

In building legislation as now generally drafted, the method of formulation of regulations is to describe the manner in which compliance is to be obtained. Some define the objective sought and include several descriptions of the ways in which this objective may be met. Others, failing to state the objective, describe only the assemblies of materials which are permitted.

For example, in the matter of resistance to fire, some codes will state this objective in terms of a number of hours or minutes resistance in accordance with the Standard Fire Test. Then they will describe in the code the assemblies which are approved for a particular purpose.

In Chicago complete responsibility rests with the City Council. Over half the Municipal Code of Chicago is concerned with Building Regulation. The Aldermen, one from each ward, are a cross-section of the peoples of Chicago. Naturally, they are not selected for their technical skill or knowledge in the field of building regulation.

Log houses, Wolf's Point, Chicago, 1833

Since its adoption in 1939, the Chicago Building Code has been continuously before the City Council for amendment. The City Council has never been free of the burden of detailed regulation in this highly technical field. This burden in many of its aspects is unfairly, unwisely and unnecessarily placed upon the City Council.

Over 200 sections of the code have been amended at least once and some several times since its adoption in 1939. In addition, a number of sections specifically relating to war housing have been added. It is unfortunate, however, that it was necessary for the City Council to be concerned with these problems, many of which were of a minor technical character. Such detailed consideration of the code prevents the Council from viewing the code as a unity. Due to the diversity of the subject matter, the legislature faces a difficult task in securing effective coordination of all of the regulating activities affecting building.

The determination of the level at which standards should be established has become, through the study and research of recent years, a more scientific process. The minimum standards of building regulations which translate the basic objectives must be formulated from technical findings based upon research and data assembled and interpreted by experienced and qualified persons if they are to be soundly conceived. They should not be determined as a result of political considerations or compromise between various pressure groups.

4. PERFORMANCE CODES VS. SPECIFICATION CODES

In recent years there has been a growing appreciation that the "specification" method of writing regulations in codes has definite disadvantages. Authorities are becoming convinced that the requirements should be stated in terms of the desired objective rather than in terms which describe the method of achieving the objective.

Performance standards state the functional purpose or objective of the standard. To put it negatively, they do not describe the materials used or the way in which the materials are to be assembled; they state what is expected of an assembly of materials for a particular use. Performance standards then, when passed by the legislature, provide the basic criteria for the acceptance of any material or method of construction whether traditional or new, for the particular use covered by the standards. Standards of good practice for existing materials and methods of construction are established in regulations written by the administrative agency to accord with the performance standards established by legislation. New materials and methods are investigated and tested by the same criteria. On the basis of these findings, regulations prepared without legislative action control the use of each new method or material which, after a finding of facts, proves capable of meeting performance standards. Such a procedure provides the complete flexibility and responsiveness to new developments which is desirable. The legislature in this manner formulates the policy and delegates to the administrative agency the authority, within the limits defined by the legislation, to write the rules and regulations controlling buildings.

The Engineering Division of the Department of Public Works of Kansas City, Missouri, has prepared a proposed code now in its second draft which is designed to adopt insofar as possible the technique of performance standards. Under Section 302, "Rules and Regulations," is the following paragraph:

> *"The provisions of this code are designed to provide the standards of strength, safety, sanitation, and fire-resistance to be met in any building or structure to which the code applies. They are not intended to prevent the use of methods of construction, materials, or equipment which, as a matter of fact, will meet the required standards.*
>
> *"For the purpose of determining questions of fact as to whether any method of construction, material, or*

BETTMANN ARCHIVE

Randolph Street in 1865

equipment will meet such standards, the Board of Standards and Appeals shall make, or cause to be made, investigations, or may accept duly authenticated reports from nationally recognized testing laboratories and engineering and technical sources, on methods of construction, materials, and equipment. They shall in the first instance embody such findings of fact in findings called 'Rules and Regulations.' All persons may use the methods of construction, materials, and equipment embodied in the 'Rules and Regulations' without further showing that the same will meet the required standards."

Section 2412 reads as follows:

"*The standards of quality and strength of materials and the methods of design and construction which will produce structures meeting the minimum provisions of this code are listed and specified for in the 'Rules and Regulations'.*"

An example of the type of standard established by the code which is later to be specifically defined by the rules and regulations is the following:

Section 2601. "Walls shall conform to the fire restrictive requirements set forth in this code and shall be constructed of such materials and minimum thicknesses and with such material bracing as to be stable and to support their weight and the loads which may be placed upon them without exceeding the stresses allowed in generally accepted, good engineering practice for the materials of their construction. Exterior walls, bearing walls, and fire walls and their vertical and lateral supports shall be capable of resisting the pressure of wind applied to either side. Wind pressures to be assumed in the design of such walls shall not be less than the minimum pressures specified in Section 2407."

The chapter on walls goes on to limit specifically the character of walls which may be accepted. For instance, it limits the height of masonry walls. It provides a basis for determining their thickness and for their lateral support. For the most part, these requirements as expressed in the code are general guides amplifying the performance standard, for the formulation of rules and regulations. As such, they require interpretation to become effective.

The success with which an administrative agency can keep its regulation *au courant* with new developments by accepting new materials and methods of construction, recognizing increased quality in conventional materials due to improved manufacturing techniques, making use of data provided by research, and permitting improved planning techniques is limited by the manner in which the regulations in the building code are formulated.

The industry is a dynamic one. New materials and new methods of construction are being constantly developed. Standards of safety and of health and concepts of welfare develop with our increasing social awareness. To meet the need for better construction at lower costs the legal device chosen must permit recognition of these developments in materials, methods of construction and planning techniques. Codes based on performance standards offer the best approach to this objective.

5. ADMINISTRATION TECHNIQUES

More and more, it is becoming legislative practice to delegate the interpretive process to administrative bodies. Legislative bodies naturally act only at the behest of some interested group since they are unfamiliar or unaware of changing developments and consequently must await suggestions to determine the need for, or course of, action. Hence, responsibility must be placed where there is cognizance of the problems of the regulated parties; the public, the architect, the builder and the materials producer.

The proposed Kansas City Code shows how well a code based on performance standards solves this problem. It provides, indeed, a positive conception of building regulation. This is permissive regulation in the best sense, giving the architect, the manufacturer and builder an incentive to try new directions of construction achievement while at the same time protecting the community from unsafe practices.

It has been recognized for some time that administrative interpretation of building regulations is needed to supplement legislation contained in the code. The degree to which this has been possible has varied within the jurisdiction of each state. In the case of Wisconsin, the Industrial Commission was empowered by the State Legislature "to ascertain, fix and order such reasonable standards or regulations for the construction, repair and maintenance of . . . public buildings, as shall render them safe." A public building is defined as "a structure used as a place of assemblage . . . occupancy, or use by the public or by three or more tenants." "Safe" is defined as such freedom from danger to occupants "as the nature of the case will reasonably permit."

This is an extremely broad delegation of power by the legislative body to an executive agency, with an equally broad definition of the performance to be required. Quite

justly such a broad delegation of power can be open to serious question. While this power has not been abused in Wisconsin, it is conceivable that such a delegation of power would not always be wisely administered.

In most jurisdictions, on the other hand, administrative bodies have been more circumscribed by the legislatures, state or municipal, which have delegated interpretative powers to the executive branch of the government. In New York City the Board of Standards and Appeals can supplement the code as well as interpret it, but it cannot modify it. Here the Board is limited in its interpretation by a traditional specification code which can only be changed by legislation enacted by the City Council. The New York Board of Standards and Appeals has an enviable record, despite this very obvious handicap which would not have existed were the code to include performance standards rather than specifications.

In Chicago, the City Council established in 1939 a Committee on Standards and Tests. This committee, however, was given only an advisory status. It could merely recommend action by the City Council. The result has been that it has proved ineffective as an interpretative device. Less than 10 per cent of the actions of the City Council in modifying the code have resulted from the recommendations of this powerless committee.

In many jurisdictions, the cost of proper administrative interpretation is beyond the scope of the budget in spite of the obvious need for it. In its Administrative Requirements for Building Codes, the American Standards Association recommends that the building official be empowered to accept new materials and methods of construction on the basis of satisfactory evidence. The rulings and interpretation of the building official are subject to appeal to a Board of Appeal. The provisions of the Boston Code are almost identical with this recommended practice.

These administrative techniques, designed to prevent code obsolescence, can succeed only to the extent that they are not hampered by a specification code. Modification of a specification code by legislative amendment is a slow and sometimes costly process which few individual companies, builders or architects are willing to initiate. Obviously, where the performance standard type of code is adopted, it is necessary to employ an administrative technique for the implementation of the code through the formulation of rules and regulations. The personnel of the agency or board must of necessity consist of men technically trained in the various branches of the construction, design and use of structures and their equipment. They must be qualified to evaluate technical data resulting from research, interpret the findings of tests, and establish test procedures.

In establishing such an administrative technique, it is desirable that the procedures controlling its actions incorporate safeguards to assure adherence to democratic principles. Provision must be made for the requirement of hearings, notices and appeals in the adoption of rules and regulations. Such provisions will serve to reassure the judiciary in those states where there has been a reluctance by the courts to permit delegation of legislative power. While, undoubtedly, these procedures make the problem of building legislation more formidable, they give necessary protection to all the interests involved and lessen the danger of arbitrary action.

BETTMANN ARCHIVE

Chicago before the great fire of 1871

Enforcement of the code and its rules and regulations is a separate administrative function although it may, in some jurisdictions, devolve on the same personnel. It is a problem with which all municipalities are familiar. The machinery for permits and inspection is generally in existence. Efficiency in its operation will depend on the way in which it is organized and staffed.

Administrative Agency or Agencies

Since one of the great problems in code preparation and enforcement is the coordination of the building requirements, consideration must be given to this aspect of the administrative problem.

In a Questionnaire — 13 municipalities — all large cities with similar problems and resources — reported that there was no municipal agency, with minor exceptions in several cases, other than the Building Department which enforced requirements affecting the construction of buildings or the installation of equipment. These cities all found advantage in consolidating the enforcement of building regulations in one department.

In Chicago — building is regulated by several different departments. In addition, one department and four independent agencies of the government are concerned with building regulation. The tendency in Chicago has been to compartmentalize building regulation in departments which specialize in the subject of the regulations. For instance, electrical inspection is made a responsibility of the Bureau of Electricity of the Department of Streets and Electricity.

In Detroit — all of the codes pertaining to the construction, alteration and maintenance of buildings and other structures were administered by a Department of Buildings and Safety Engineering. In June, 1945, however, the City Council gave full responsibility to the Fire Department over conditions for the storage and use of inflammables and the handling of explosives together with conditions affecting places of public assembly. The result of this action of the Council is to divide the responsibility for adequate fire protection and to raise

questions concerning the respective jurisdictions of the Building and Fire Departments.

In Hartford — construction and alteration of building is under the Department of Buildings. The Building Department shares control over maintenance and use of buildings with the Fire and the Health Departments.

In Portland, Oregon — the Bureau of Buildings of the Department of Public Works enforces the building, housing, zoning, heating and ventilation, plumbing, refrigeration, electrical and sign codes. The Building Bureau is required to secure approval of the Fire Marshal of fire escape and standpipe installations in large buildings. The Bureau of Health enforces regulations pertaining to restaurants, hospitals, old people's homes, children's homes and establishments where food is manufactured and prepared.

The Great Conflagration of October 8, 1871

From these examples, there seems to be little difficulty in consolidating in one department enforcement of those regulations which are concerned with engineering and structural requirements, plumbing requirements within the building, zoning regulations and installation of electrical, heating and ventilating equipment. The chief difficulty, apparently, is in achieving a line of demarcation between the responsibility of the Building Department and that of the Health Department and the Fire Department. Both the Health and the Fire Departments are primarily concerned with the use of buildings and secondarily with the construction and alteration of buildings to prevent conditions which make for hazardous and unsanitary conditions.

While no consistent administrative pattern has been developed for building regulation in other cities, the solutions indicate that it is administratively practical to place responsibility for building regulation in one agency with its activities supplemented by other agencies. By this means, entire responsibility for safety to life and health in relation to building construction and maintenance would be centralized. The administrative agency also could assist the legislature in achieving complete coordination of all requirements affecting building. Certainly the placement of responsibility for the enforcement of building regulation in one administrative department should produce a more coordinated pattern of building regulation than is possible with the present diffuse organization which now exists in a city like Chicago.

Where the recommendation for a performance standard code is adopted, it is even more important that it be administered by a single agency. In this case, general standards set by the legislature must be interpreted by the rules and regulations of an administrative agency. With these two things — objectives of safety, health and welfare established by legislation in a performance standards code, an interpretation of that code in the regulations of a single agency — a new pattern for building legislation can be established.

6. WHAT CODES COULD BE

In departing from the present negative concept of building regulation, it is essential that care be taken to insure against undermining the fundamental conception of safety which is the primary purpose underlying all building regulation.

Standards must be based on an adequate research program, a research program which eliminates prejudice and opinion as much as possible and substitutes for them scientific fact or data. These standards should be framed to permit the use of any material or assembly of materials or design which meets the objective intent of the standard. To adequately interpret the standards will require the establishment of methods of measuring performance. These may be design standards or test procedures developed through research.

The objective of these standards aside from assuring adequate safety should be to make available to the community the benefits of all developments in materials and methods which lead to lower costs, better construction or improved standards of living. To accomplish this objective, the normal negative philosophy of the building code administrator will have to be modified. He should realize that it is his obligation not only to protect the community but also to make available to the community the benefits of new developments.

State Codes

The constitutional basis for building legislation is derived from the police power. This power is one which was reserved by the states and, hence, is essentially a local power. Traditionally, it is a power which has been, for the most part, delegated by the states to municipalities. Any new pattern of building regulation must recognize this condition.

A code based on performance standards will necessarily require trained technical and administrative personnel. Such a code places a great obligation upon the administrative body to interpret its standards by supplementing rules and regulations. In general, only the building departments of the 14 or 15 cities with population in excess of 500,000 will have the resources to

justify such an organization. As a consequence, if we are to have codes which make possible this new concept of building regulation, it would appear that the *state* would be the logical body to establish and interpret building regulation.

With the adoption of the philosophy of performance standards, a state code becomes a more feasible and practical document than the existing specification type. Modifications required to meet local conditions can be incorporated in the rules and regulations which supplement the performance standards. In this manner, such local conditions are recognized as the establishment of fire districts, particular or peculiar soil conditions and other local factors.

Under a state code, the enforcement could be carried out by locally appointed officials who would have recourse to the state in the interpretation of the performance standards established by the state code as they applied to materials and structural assemblies and the design and use of buildings. These rules and regulations which the local building official enforced would be developed by a state board of standards to whom all manufacturers of materials would apply for acceptance. By this means, the number of code jurisdictions would be reduced from the present 2000 to less than 50.

Such a pattern of building legislation should serve to raise the general level of building standards. Placing the drafting of the performance standards and their interpretation in more competent hands is made possible by centralizing the responsibility for building standards. It should tend as well because of the expected increased competency of the personnel to provide a more realistic approach to building regulation. The effect of opinion and prejudice would be minimized by substituting therefor, technical fact-finding. It should simplify the problem of the builder, the architect and the material producer by reducing the number of jurisdictions regulating their activities.

An alternate solution, offering many of the same benefits, for those states which wish to preserve the local autonomy of their municipalities, would be the creation of a State Building Department. One of the duties of the department would be to prepare a model performance code for the municipalities of the state. Rules and regulations to supplement the code would also be prepared by the same agency. Besides providing an advisory service to municipalities in the preparation of their local codes and in the adaptation of rules and regulations to local conditions, the same body should provide a technical advisory service designed to keep rules and regulations up-to-date. In order to reduce the costs of duplicating functions in each municipality, the state building department should supervise, design and interpret the results of tests of new materials and methods of construction.

Rebuilding Chicago after the fire

National Research

There must be a sound technical basis for building standards. A national research program should be designed, not to develop standards, but to provide the basic factors which are required for the formulation of standards and their measurement. The establishment of the level of standards is a legislative process which the people should reserve to themselves. While the standards themselves are essentially technical in their derivation and phraseology, the establishment of a level of standards should result from democratic processes.

The standards included in the various building codes should be as uniform as possible. At the present time, a number of agencies are engaged in developing model standards for adoption in local building codes. To the degree that these standards are developed on a democratic basis, with full representation of all of the public and private interests involved, and to the degree that they represent a sound technical basis they are providing standards worthy of consideration.

In view of our traditional philosophy, it is probably more desirable that these semi-private agencies perform this service of developing standards rather than employing the device recently developed in Canada. There, under the aegis of a governmental committee representing the various private and public interests, Canada has developed a model national code. Such a device, of course, is open to this country provided it is found desirable or if the activities of the existing semi-public agencies proved inadequate. However, we have in the American Standards Association, the American Society of Testing Materials and other similar organizations, agencies upon which it would appear we could rely for the development of standards on a sound democratic and technical basis. These agencies are doing a splendid job although it is only partially complete. Much work remains which they should be encouraged to complete as soon as possible.

While a new pattern of building regulation can be formulated now by stating objectives in general terms, more work remains to be done before it will be possible to translate those objectives properly into rules and regulations. Although a great deal has been accomplished in the accumulation of scientific data, considerable additional research is required before performance standards can be adequately interpreted on a strictly scientific basis. Much pioneering will be required to achieve the full results in this new pattern. It is essential, however, that a start be made in this direction if the factors in building legislation which now hamper the construction industry from making its real contribution to society are to be removed, and if the industry is to be encouraged to perform at its fullest capacity.

FULL FREEDOM FOR THE CHILDREN AND PEACE FOR PARENTS

House for Mr. and Mrs. Richard P. Minor, San Mateo

Wurster, Bernardi & Emmons, Architects

IT IS not often that a house plan, subjected to cold analysis, radiates such a note of warm enthusiasm as seems to surround this one. Mr. Wurster writes quite directly of the architects' enthusiasm for this planning assignment. More important, perhaps, is the consideration with which the clients anticipated the needs of their own children, and their children's friends. And the pictures on succeeding pages speak for the enthusiasm of the children for a house in which their energies and interests have no spatial barriers.

Circumstances surrounding this planning project were particularly fortuitous. The architects had already done some thirty houses for this client, a speculative builder. There was, then, complete understanding, no need for soul-searching. And besides, the architects had a special yen to be of service to someone of exceptional appreciation. The plan gives evidence enough of the freedom assumed in the planning.

Requirements were stated simply: a one-floor house, each child to have his own room, a gallery to serve as a playroom. The bedroom gallery, with its widened sitting area, is, of course, the key to the whole plan. The ground slopes somewhat, so that the bedroom gallery is a few steps above the dining room gallery; thus there is a natural barrier to the mess of toys which might otherwise flow toward the main entrance. Both galleries open to the spacious outdoor terrace, which in turn leads to a still larger play area with a tennis court. As if all this were not enough to keep the children occupied — and protect the living areas from their occupation — there is a large playroom in the basement for any possible overflow, and for serious hobby work.

The idea of galleries in place of mere corridors works well also in the living area wing. The folding doors of the dining room either set this area apart, for formal entertaining perhaps, or join it to the sunlit gallery or to the terrace beyond. Virtually every room similarly flows out to the terrace.

Mr. Wurster characterizes it as "an unstyled house — an untortured house." Perhaps, he continues, it best illustrates the feeling that houses are frames for living; what goes on inside gives the flavor and color, not tricks by clever pencils. "All we did was to think of a large family, turn them loose, and out came this plan."

From a huge entrance shelter the front door leads to a house designed not only for outdoor living but also for very active living indoors. While the house flows around, and into, a huge outdoor terrace (and thence to a play area with tennis court), the spacious galleries give ample evidence of the family's determination to give their children plenty of room inside as well as out. And as further insurance against claustrophobia, there is a basement playroom

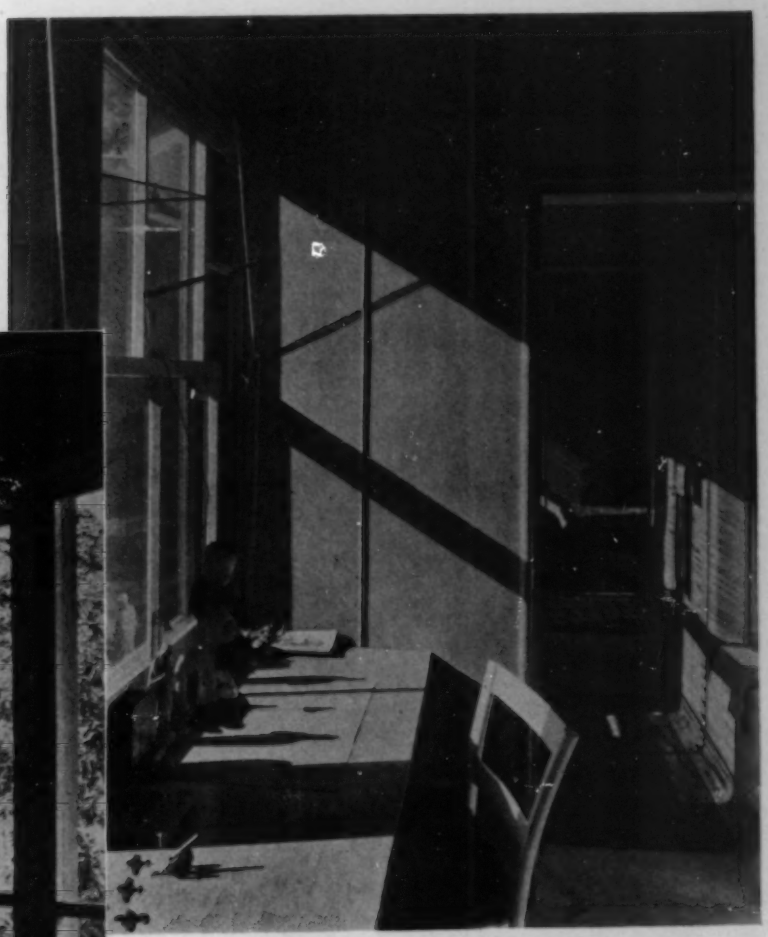
ROGER STURTEVANT Photos

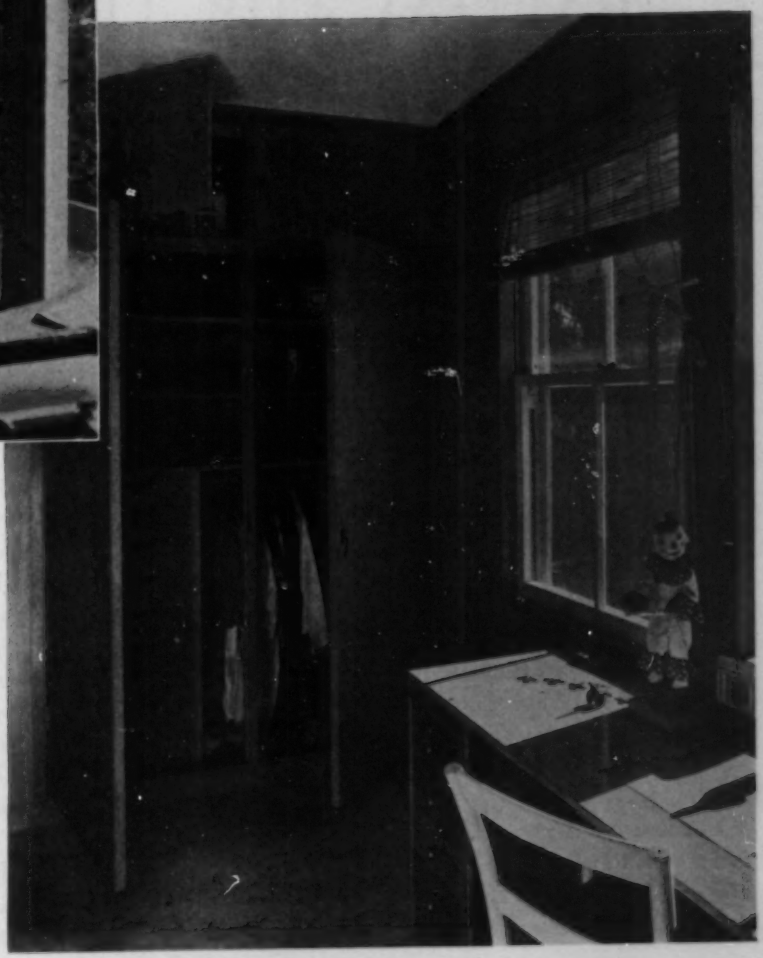
The dog lying on the living room rug is probably just the photographer's idea, for certainly he (the dog) has plenty of space elsewhere, both in- and outdoors. The dining room can be thrown open for family meals, or closed for dinner parties. The tile floor can take abuse and still be presentable on short notice

The almost completely enclosed terrace serves young and old alike. It suggests a point about this house that is worthy of note: all of the facilities so spaciously planned are readily adaptable to changing needs of a growing family, from the stage of scattered toys to that of relaxation in the sun

This view of the entrance gallery as seen from the living room door pictures still another point about the house. Mrs. Minor is a graduate of a college course in agriculture; in the main gallery and the terrace she has plenty of scope for a green thumb. Tile floor can stand the watering

What might have been just a necessary corridor is here a long, wide play space, well dimensioned for the working-off of energies of children, particularly when indoor ball-throwing is involved. At the near end in this view it has been still further widened for a play-sitting area. Being far removed from living and dining rooms, this play gallery can be freely turned over to the children, and the picking-up can be left for a convenient time. View in upper left-hand corner shows the service area adjacent to rear entrance





If a child needs plenty of room for active play, he also needs his own private domain, where his peace and his possessions are safe from family and friends. So the house provides a room for each child, with spacious closet and built-in wardrobe. Though the bedrooms are not unusually large, they are planned for use also as study rooms, with built-in desks to develop space efficiently. Hobbies are encouraged through a basement hobby-playroom

Program Preview

CAPITAL FOR THE UNITED NATIONS

By Ed. Allen

International News Correspondent

THE Planning Commission of the United Nations will arrive in the United States soon to build a capital from scratch.

The members will have the financial backing of 51 nations and the aesthetic support of youthful, forward-looking diplomats.

They will have 40 to 50 square miles of hand-picked, gently-rolling countryside to build on. I accompanied the Site Inspection Group which toured the eastern United States in January. An inspiring view was their first demand at every site.

The architects selected to lay out the new world capital will be handed a blank sheet of paper on which to put their noblest ideas. They will not have to worry about space restrictions, financial limitations, or straitjackets of design.

They will not have to worry about time, either. The UNO plans to occupy rented interim space three, four, five, or as many years as necessary to get the job done right.

The first problem of the Planning Commission when it arrives will be the arrangement of interim facilities. Since the delegates to the second half of the first General Assembly session are expected here in late summer, some of the temporary accommodations may be rather makeshift.

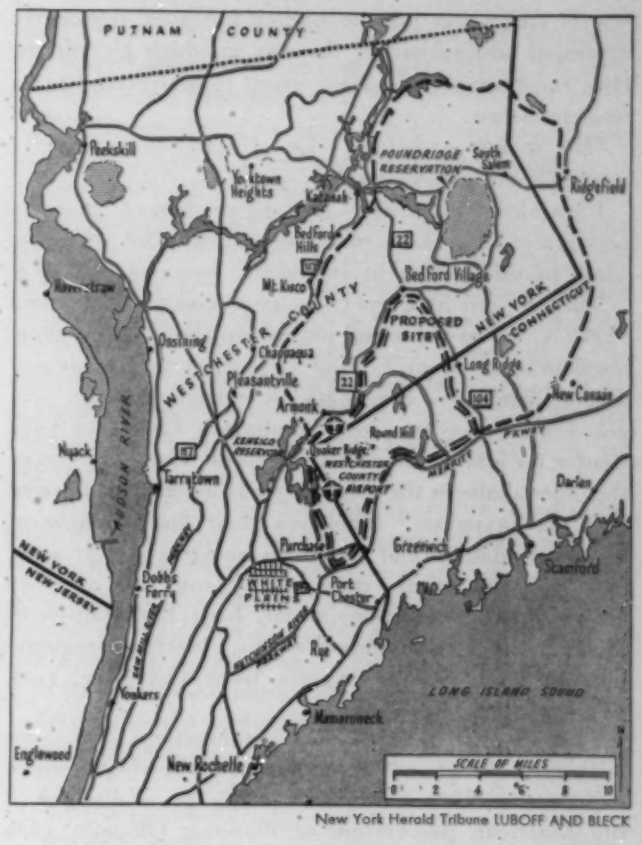
In the meantime, no one will be quite sure whether the world's best architectural brains are to have a chance to work for the UNO in concert or in an atmosphere of intrigue. Political considerations did not appear to weigh with the site committee when it selected American engineers for the preliminary surveys in January. The work, nevertheless, was carried on with the usual diplomatic hush-hush.

The names of the engineers were not made public until they had finished their site surveys. Dr. Stoyan Gavrilovic, chairman of the seven-nation committee, said secrecy was maintained to save the consultants from being hounded by reporters, cranks, and self-seekers. Such secrecy, if employed in laying out a city embodying the world's best hopes of peace, might prove fatal to sound planning or good design.

If Dr. Gavrilovic has his way, there will be some sort of international competition. As of today, however, the world's architectural societies have announced no plan to help it get off on the right foot. At press-time, no American or international committee had been named to consult with the UNO Planning Commission. The

Opposite page: Hyde Park, N. Y., was a leading contender as the site of the permanent capital of the United Nations, even though it would require moving out a whole village. Engineers were a bit cool to this site, and there were political considerations both pro and con. The final Assembly vote went for the Westchester site

Right: Just at press time this site became the "unanimous" choice of the United Nations Assembly, and now is the official selection. Known early as the North Stamford-Greenwich area, later as the Westchester-Fairfield area, it was enthusiastically recommended by engineers. Map shows proposed site and possible enlargement



New York Herald Tribune LUBOFF AND BLECK

Museum of Modern Art was out first with a suggestion for an international competition to select an architect.

The American State Department has taken a hands-off attitude from the beginning. The U. S. delegates to the UNO Preparatory Commission carefully refrained from voting on selection of the United States over Europe as permanent seat of the UNO. They took no position in the debate as to whether the new city should be in the East or the West. It remains to be seen how much influence the American representatives will bring to bear in seeing that a capital is built which reflects the genius and tradition of America along with the international aspirations of a cosmopolitan assembly.

Meanwhile, for those architects who are interested in such a challenge, here are some of the facts about the new world city which Dr. Gavrilovic told me:

It will have an initial population between 35,000 and 50,000.

It may grow in a few centuries to a world metropolis somewhere between 100,000 and 400,000.

The so-called "monumental" buildings to be finished around 1951 will be substantially larger than the old League of Nations plant at Geneva.

Functionally, they will be similar.

The permanent Secretariat will need offices in five years for 2,200 persons.

In addition, there will be 80-odd special agencies and commissions clustered around the UNO, including a few hang-overs from the League.

Dr. Gavrilovic listed the following minimum building requirements:

An assembly hall for 3,500 persons, with balconies for the press and public.

A number of committee rooms, some large enough to hold 1,000 persons.

Accommodations for 3,000 representatives of the world's press, radio, and motion picture syndicates — with appropriate lounge and bar. (I think the good doctor is over-optimistic. Space for 1,000 press representatives will be ample after the novelty has worn off.)

Four or five hotels capable of handling 5,000 persons at the annual and extraordinary sessions of the General Assembly.

An airport large enough to accommodate the biggest ships or rockets contemplated now or in the centuries to come.

A communications station which in time may become the largest single center on the continent for the handling of news and commercial messages.

A Junior Pentagon to house the World Police Force under the Security Council.

Residences, offices, and apartments for the Secretary General, the permanent secretariat and affiliated agencies.

A world university centered around the old League of Nations Library.

Cafeterias and service buildings.

The UNO does not at present contemplate an extensive commercial center within the bounds of the international settlement. It plans to keep an outer fringe of parkland between it and the mushroom suburbia that is likely to spring up — tourist stands, cabins for camp followers, and the like.

Perhaps some enterprising architect will design a community shopping and amusement center sufficiently in keeping with the grandeur of the rest of the new world capital so that career diplomats like Dr. Gavrilovic will withdraw their opposition to having it inside the city.

Many inconveniences are bound to result if the politicians of 51 nations have too much to say about what the architects are doing. The architects should be given broad terms of reference and allowed to produce a forward-looking plan superior to the amateur imaginings of diplomatic minds.

One of the weaknesses which I observed in the site inspection group last January was the fact that its seven members were all diplomats. Dr. Gavrilovic, a Serbian

lawyer and writer used to Balkan intrigues, frequently expressed admiration for the way in which Dr. Shuhsi Hsu, the Chinese delegate, seemed to understand technical problems.

"He is our architect," Dr. Gavrilovic said. "He learned it all in three weeks."

I am afraid the visitors did not get a very good impression of American architecture from what they saw while house-hunting in an already overcrowded area.

They looked at a great many mansions at Tuxedo Park, N. Y., in the grand manner of the nineties, some obsolete shore property, and some rundown camps and schools. The New York City committee seriously proposed that they take the Manhattan Center or City Center for interim assembly purposes. These are two of the oldest halls in the city. To what extent this hurried tour of "taxpayers" influences their final opinion of American design and designers remains to be seen.

In searching for the right plot of land, they received advice from such persons as Dr. Karl T. Compton of M.I.T., George Holmes Perkins, Harvard regional planner, and various experts from the New York Regional Plan.

Through the various local organizations and committees, they met and commissioned a group of American consultants. Walter Blucher of Chicago, a director of the American Association of Planning Officials, gave them over-all advice. Russell V. Black of New Hope, Pa., planning consultant, directed the men who examined land in the Hyde Park, N. Y., region. Joseph Leland and Roland Greeley, Boston architects, were retained to report on the Blue Hills area south of Boston.

Harold M. Lewis of 18 E. 48th St., New York, directed extensive borings and surveying work in the Amawalk reservoir district of New York's Westchester County. This area for a long time was runner-up to Hyde Park as leading candidate for the new world site. Mr. Lewis also reported on the Ridgefield, Conn., district. Ernest P. Goodrich of 175 Fifth Ave., New York, consulting engineer, made the report on the proposed area at North Stamford-Greenwich, Conn. Frederick J. Adams of the M.I.T. department of city planning covered the Massachusetts North Shore. Arthur Comey of Cambridge, Mass., consulting engineer, went to the Sudbury-Lincoln-Marlboro region in Massachusetts. Justin Hartzog of Cambridge, Mass., looked at land in Rhode Island.

Some idea of the complexity of the project can be gleaned from the fact that the old League of Nations once listed 806 separate public and private international commissions and societies. Not all of these were located at Geneva, however, and some will not be moved to the United States.

The International Court of Justice is expected to remain at the Hague. The Bank for International Settlements is in bad odor with the UNO because of wartime collaborationist activities, and will probably stay at Basle. The Universal Postal Union has never shown much interest in joining up.

But the International Labor Office, now occupying refugee space at Montreal's McGill University, wants to become part of the new Economic and Social Council, as does the left-wing World Federation of Trade Unions.

The International Bank for Reconstruction and Development (formed under the Bretton Woods agreement) and the International Monetary Fund will want an imposing edifice.

The Food and Agricultural Organization of the United Nations will have a considerable bureaucracy trying to raise the level of nutrition in backward countries, improving the efficiency of food production, and, in extreme cases, arranging commodity exchange agreements.

The United Nations Educational, Scientific and Cultural Organization will be busy rebuilding educational facilities in war-torn countries, arranging for international exchange of scientific and literary information, promoting better cultural understanding between nations, and co-ordinating international education.

The UNO Economic and Social Council will have many specialized agencies under it. From the old League of Nations will come various groups which combat narcotics, white slavery, child labor, and similar ills.

Agencies connected with the old League included the International Red Cross, International Hydrographic Bureau, International Exhibitions Bureau, and International Relief Union. Some of these will have their counterparts in the UNO.

It is not yet clear whether the Red Cross will stay in Switzerland or whether the temporary United Nations Relief and Rehabilitation Administration will have a reason for quitting Europe.

The Pan American Union may wish to take an active part in the new city, although it certainly will not give up its fine quarters in Washington, D. C.

The International Civil Aviation Organization is among the permanent groups already started.

Dr. Gavrilovic is very much interested in advocating a new international university to work with and through many of these agencies.

He hopes the old League library, which was backed by a $2,000,000 grant from the Rockefeller Foundation, will form its nucleus. Even his interim plans call for a library of 400,000 volumes.

If mankind succeeds in solving problems of the atomic age, and if the UNO lives longer than the League did, the Security Council will become a bureaucracy to reckon with. Any kind of World Police Force will need permanent barracks, drill fields, air fields, and headquarters. There will have to be a chief of staff, adjutant general, quartermaster general, and various other supply and service organizations. There has been some talk that the American 82nd Airborne Division will furnish the "flying cops" for this global army.

If the UNO succeeds in eliminating force as the compelling factor in international business competition, new agencies will spring up to represent new forms of cooperation.

A World Customs and Currency Union, for instance, would seem a logical outcome. Its offices would be more than just another sub-treasury or post office. They would help inspire millions to believe in the credit and good

faith of their neighbors. They would offer a challenging opportunity to architects.

The citizens of the future will not be content to walk from building to building or to ride on any such contraption as the congressional railroad under the national capitol at Washington. Some sort of moving sidewalk is in order.

Prosceniums and stage effects must be arranged to anticipate the widespread use of television in the future. It is probable that plenary sessions of the General Assembly will be televised.

The helicopter or some even more advanced short-hop air vehicle is apt to supplant the lowly taxicab in getting the diplomats to and from major airports — or major night clubs.

Architects interested in problems relating to radio and telephone communications will do well to brush up on problems overcome by the Army Signal Corps during the war — especially on occasions such as V-J Day. They will also be wise to refer to problems handled at the San Francisco Conference.

Every planner will have to keep in mind problems relating to security and changes in world habits.

His plans will have a dual relation to security — security of the UNO on the inside; and security of the United States on the outside. The Secretary General must be given every sort of structural assistance in protecting UNO offices and archives from molestation, and also in preventing the city from being used as a nest of spies and intrigue against its host.

The Secretary General and his Planning Commission appear to have sufficient authority to make most of the decisions concerning the new city without referring back to the General Assembly.

They are not likely to repeat some of the mistakes the young American republic made when it had a chance at Georgetown to build a capital from scratch.

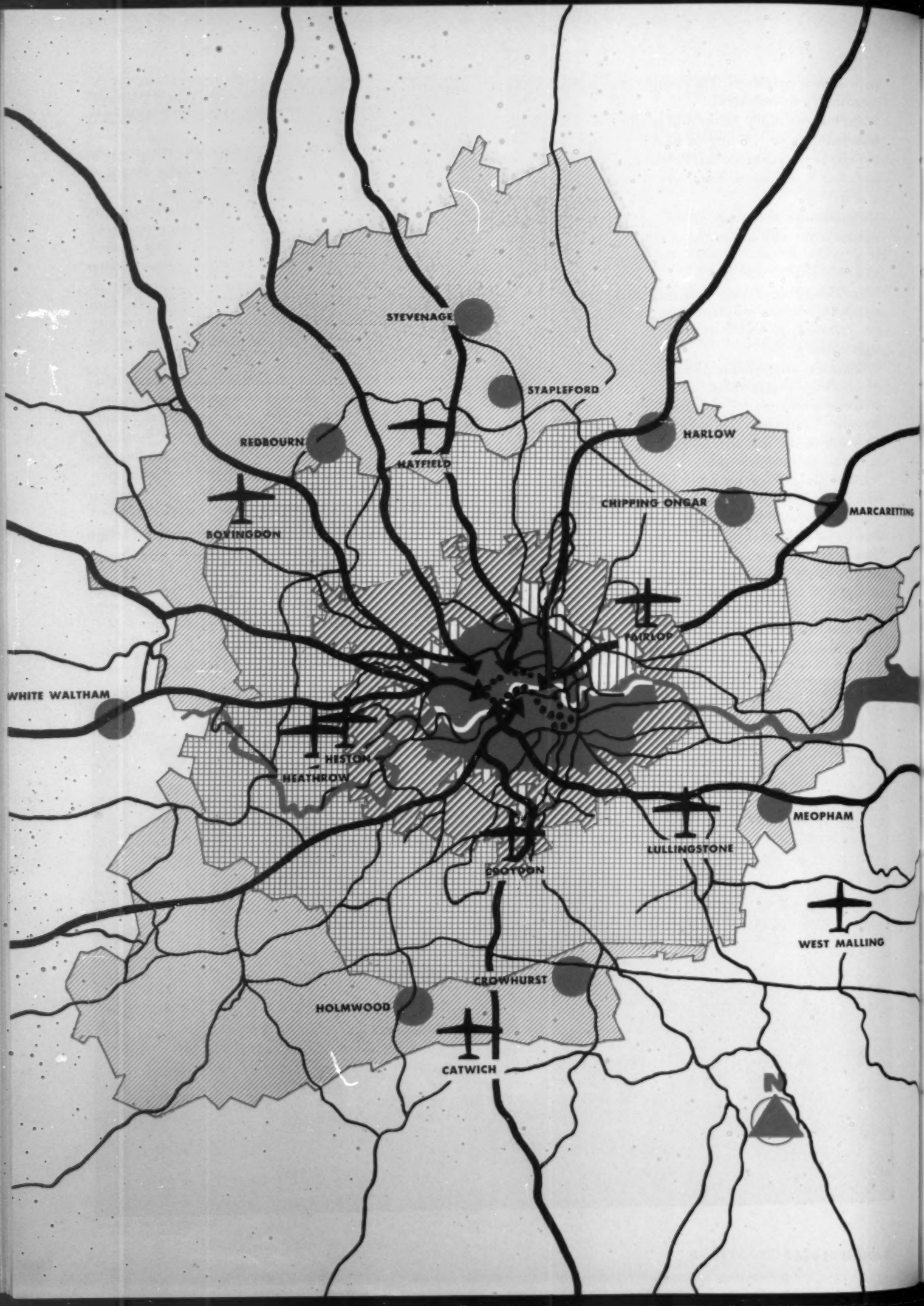
From the point of view of elevation and climate, the new city will be better situated than Washington, D. C. It will be protected by "buffer" land and water against having its buildings face in the direction of tenements. With modern zoning and housing, there will be no reason why there should be any tenements at all. With adequate planning, there will be no reason why the city should grow in a different direction from that of its planners.

The thinking of Napoloen Bonaparte need not influence the engineers to lay out concentric avenues with circles to be defended against an hypothetical rabble. The transit and vehicular traffic confusion of Washington, D. C., will be avoided. But let us hope the final result will be as fine a tribute to our times as Washington is to the men who founded the republic.

Architects who do not like to see their work destroyed by atoms will have a special urge to build a city to last.

The UNO committee inspects a part of the Hyde Park site. Left to right: Francois Briere, France; Awny El Khalidi, Iraq; Dr. Shuhsi Hsu, China; Huntington Gilchrist, United States, secretary to the group; H. E. Dr. Stoyan Gavrilovic, Yugoslavia; Maj. K. G. Younger, United Kingdom; Don Julio A. Lacarte, Uruguay; Georgii Saksin, U.S.S.R.

ANTONY CALVACCA Photo


STEVENAGE
STAPLEFORD
REDBOURN
HATFIELD
HARLOW
CHIPPING ONGAR
MARGARETTING
BOVINGDON
FAIRLOP
WHITE WALTHAM
HESTON
HEATHROW
MEOPHAM
LULLINGSTONE
EDGTOON
WEST MALLING
CROWHURST
HOLMWOOD
CATWICH
N

MORE LAND FOR LONDON

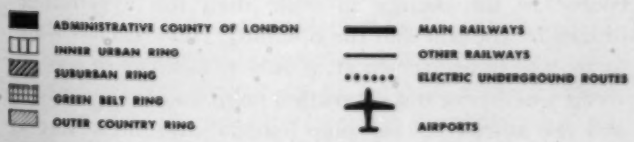
County of London Plan is first detailed proposal for the deliberate dispersal of excess population

*by W. G. Holford**

THE PLAN for the great built-up area of London — known as the County of London — was called for by Lord Reith in April, 1941, at a time when people in Britain were looking far into the future. They were taking this long view because the outlook was bleak and uncertain, the whole nation was still preparing itself for an enormous effort of defense and then offense, and there was no time for red tape. In a more literal sense eyes were searching the night sky and the far horizon for signs of German planes. In this atmosphere, and particularly for those whose work still lay in the great congested urban mass of London, it was not difficult to find a response to the desire to plan ahead for the then still hazy period of reconstruction.

What was remarkable — now one looks back on it — was the fact that the London County Council called in one architect, partnered him with another — their own, gave them such assistance as was possible in days of restricted manpower, and after two years boldly published to the world the results of that collaboration. It is true that the first architect was Patrick Abercrombie, professor of Town Planning in the University of London, and father of "regional surveys" throughout England and Wales. It is also true that in J. H. Forshaw, the Council's architect, he found a sympathetic partner and a man who knew how to organize the resources of one of the largest architectural and housing offices in the country. Nevertheless it showed not only wisdom but courage on the part of the Council that they should commission, not lawyers, nor economists, nor even surveyors, but two men accustomed to design in three dimensions; and that they should have given them their confidence during the preparation of the plan and honored its recommendations afterwards.

PLAN FOR GREATER LONDON. Published about a year ago, the plan for Greater London complements the earlier County of London Plan, extends the area comprehended in integrated plans to 2,599 square miles. It delineates four more or less concentric ring areas surrounding the Administrative County of London: the Inner Urban Ring, the Suburban Ring, the Green Belt Ring, and the Outer Country Ring. Significant in the scheme is the proposal to remove from 500,000 to 600,000 people from London, these to be placed in existing suburban communities, or in ten propcsed new satellites (heavy dots on map)



New Government in Power

The sequence of events was as follows. Professor Abercrombie and Mr. Forshaw presented their plan to the London County Council, who, although they had commissioned it and, in fact, published it, did not officially adopt it. They asked first of all for comments on it, from government departments, from the public, and in particular from their constituent authorities, the 27 metropolitan boroughs and the City of Westminster within their boundaries. These comments took some time to arrive and more still to consider; so that it was not until the summer of 1945 that the Town Planning Committee and the Finance Committee of the L.C.C. made their report to the Council. In effect they endorsed the principles of the plan with minor modifications, and said that greater powers and more financial assistance would be needed from the government before these principles could be put into practice. It happened that soon after these events had taken place there was a

* *Lever Professor of Civic Design in the University of Liverpool; Director of Research, Britain's Ministry of Town and Country Planning; member of the Fine Arts Commission; and now appointed as Consultant, together with Charles Holden, on the reconstruction scheme of the Corporation of the City of London.*

change of government and the Chairman of the Town Planning Committee of the L.C.C., Mr. Lewis Silkin, became the Minister of Town and Country Planning.

"Assisted" Decentralization

Meanwhile, Professor Abercrombie had moved on to the consideration of the outer areas of London, the Green Belt, and the outlying country almost as far as the south coast; and at the invitation of the first Minister of Town and Country Planning he prepared a plan for Greater London which was published at the end of 1944. The two plans hang together, their standards being similar and complementary. Moreover the policy outlined in the County plan for moderate or "assisted" decentralization from the crowded inner areas is carried a stage further in the plan for Greater London. In commenting on the proposals in the first plan, one cannot fail to be conscious of their application to the second plan.

The approach to the problem has been all along "to endeavor to retain the old structure, where discernible, and make it workable under modern conditions." The main defects which the plan sets out to remedy are listed as: traffic congestion; depressed or blighted housing; inadequate and badly distributed open spaces; and an inefficient and squalid mixture of houses, factories and railroads over certain large tracts of land; all these contributing to bad conditions of living and working at the center and a consequent continuous sprawl of building along the roads, across the villages of the Home Counties, and into the surrounding countryside.

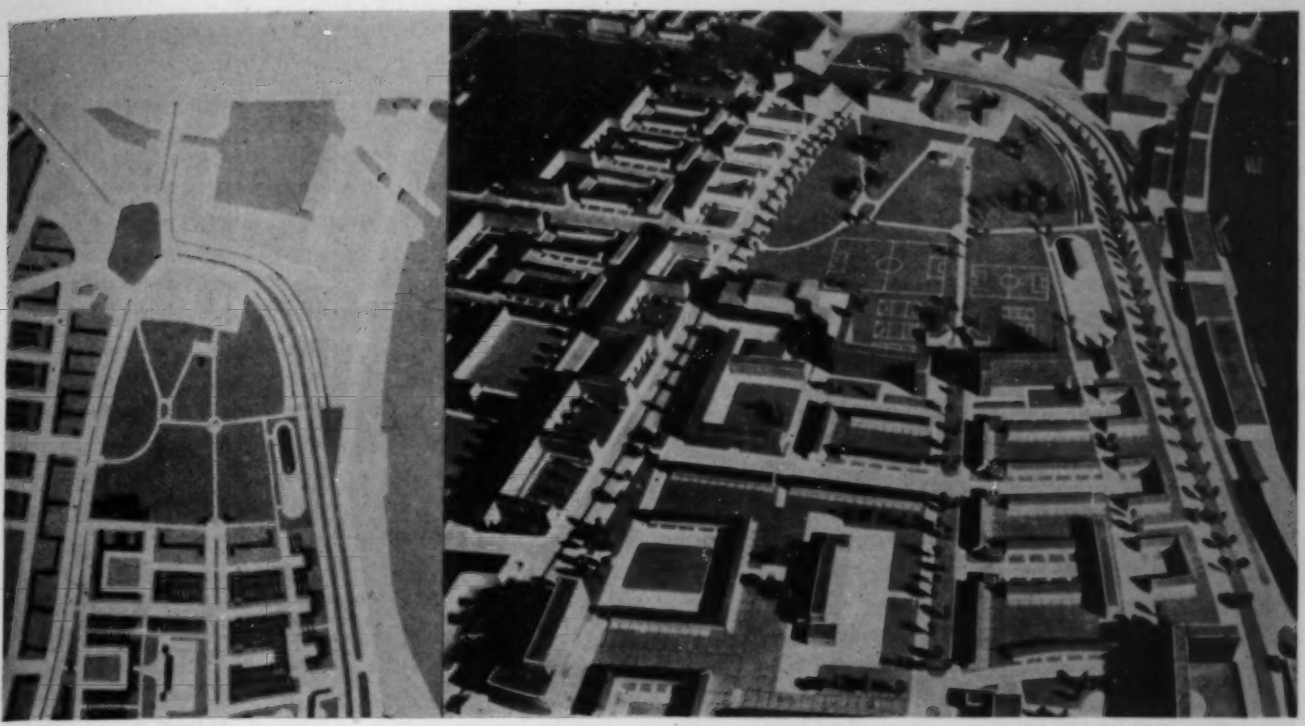
The remedies suggested are: the creation or preservation of local communities within the urban mass; the improvement of traffic circulation by creating a new system of ring and radial roads, dividing rather than passing through these communities, and so designed and classified that each road comes as near as possible to being a single and not a multi-purpose mechanism; the limitation of residential population per acre in three density zones, which allow high figures for flats in small patches but keep the over-all average for the neighborhood fairly low; the establishment of a standard of open space per thousand of the population, applicable to all areas (proposed in the plan as four acres per thousand as a minimum, and now adopted by the L.C.C. as an aim towards which the first step is to be the raising of the most deficient districts to two and a half acres per thousand); the defining of central precincts, for government in Westminster and for the University and other cultural institutions in Bloomsbury; the rationalization of the river fronts — in particular the South Bank of the Thames; the congregation of industry into a large number of defined industrial areas; railway improvements, including increased electrification, linking of terminals and the sinking of certain tracks underground; and lastly the imposition of varying grades of architectural control in an attempt to secure more orderly and more pleasant surroundings.

These proposals were the immediate remedies suggested by the visible symptoms of London's disabilities. Behind them all lay the disease itself, the uncontrolled growth of the metropolis, a kind of elephantiasis which threatened the life of the whole country. If London were allowed to grow further, it would weaken the economic and social structure of the United Kingdom; if its population were to be maintained there would be little hope of improving the living conditions of its inhabitants, since piecemeal reconstruction of small sections at a time would produce no better results than it had done between the two wars. But if the population were to be substantially reduced, how would this work out in practice in a free country, where would families be resettled, and who would compensate the L.C.C. for the unremunerative expenditures needed to turn building land into open space, and increase social provision all round for the benefit of fewer people?

To Remove 500,000 People

This underlying political decision could be approached by the planners in several ways. They could stick literally to their clients' instructions and prepare an improvement plan, disregarding the square mile of the City of London on the one hand, and the 600 square miles of Greater London on the other. They could attempt a scheme of transference to new or existing towns outside London; or they could go to the other extreme and, following the practice of New York, make provision for the same or an augmented population almost entirely accommodated in high-density apartments in the central areas. They could regard their task as primarily a quantitative re-housing estimate; or they could make it an essay in social science and political economy, pointing out that the days of the great city were numbered and that ways must be found of dispersing at least half of its prewar population. Whichever course were adopted there was bound to be subsequent criticism of the difference between theory and practice. In actual terms the County of London plan proposed a reduction (over the 50 or 60 years to which it refers) of the population actually living in the County before the war: "The number we estimate it would be necessary to remove from the congested parts of London to secure the conditions postulated in our plan is between five and six hundred thousand people."

But this estimate depends considerably on other factors; such as the rate of movement, the number already removed and likely to remain out of London, and the slowing down or acceleration of the prewar flight to the suburbs. In fact the loss of half a million people from the County over a long period would be no more than a continuation of prewar trends, and would of course be far smaller in scale than the evacuations caused by the war and the bombing. Nevertheless some figure had to be arrived at, if only to indicate in general terms whether or not saturation point had been reached; and the authors of the plan had no alternative but to



FOR THE BETTER LIFE. The plan for London itself proposes not only to reduce population densities but also to sort out housing from commerce and industry. Here is a small sample showing a typical area of the East End of London, after the sorting out process has been accomplished (in models). Housing is provided in long, low residential groups, with superstreets, garden spots and open recreational areas. The industries are grouped together along a canal at the right. For this area a railroad has been put underground

adopt a standard of density appropriate to the different parts of the County, calculate the likely surplus or deficiency, and express the result in terms of what is now known as overspill.

It is important to recognize that the County of London plan was the first widely publicized statement of the intention of a great metropolitan authority, deliberately to decentralize a considerable fraction of its population.

The Biological Aspect

Many thinking people in Britain were extremely disappointed that this proportion was not greater. The chief criticisms were that the standards were not high enough — particularly the density and open space standards — and that the fundamental biological problem had been altogether ignored.

"The present area of London County," wrote Lewis Mumford from America in the *Architectural Review*, should hold no more people than will enable it to have a net reproduction rate of at least 1.0. That answer should modify every detail of the planning. To achieve the net reproduction rate of 1.0 involves a very comprehensive program of institutional and personal changes. . . . These changes cannot be reduced purely to physical or environmental terms. And yet, within the wider processes of our civilization as a whole, certain urban patterns, certain densities, certain opportunities for human expression are plainly helpful to a high birth and survival rate, and certain others we know definitely are hostile."

And he goes on to say that England can survive in the long run only if we are willing now to pay the price of radically reducing the population of London.

These cricitisms are really one and the same; they represent the physical and biological aspects of the same social idea. It is the idea which stimulated Ebenezer Howard, and which is held by those who built the Garden Cities of Welwyn and Letchworth and the Green Belt towns of the U.S.A. It permeates the policy of regionalism and of the balanced distribution of industry. It is part of the Barlow and the Scott reports, those two documents on the planning of industry and of the countryside which preceded the County of London plan. Most significant of all, it is implicit in the promise which the present government has made, to introduce this session legislation on compensation and betterment for the improved use of land throughout the country. For this will eventually enable the pattern of development to be settled primarily on the basis of national requirements and the public interest, and only to a lesser extent on the strongly centralizing effect of urban land values.

Towards The Good Life

There is no doubt about it; this idea is growing and has already taken shape. So soon as there is leisure to think beyond the mere preservation of life, to the crea-

tion of the *good* life — in other words to bring the long point of view down to the terms of an actual program — there will be a move towards the revaluation of all the standards set up by this County of London plan. People will ask whether they could not be realized more quickly, whether they could not be extended more widely, and even improved. Mumford maintains that the conditions for London's survival do not lie primarily in the hands of the London County Council; but it may very well be that when, as is expected, national planning policy in Britain becomes more definite and more closely integrated with the general machinery of government, the L.C.C. will become the largest local agency for the execution of this central policy.

It is therefore of some interest to inquire a little further into the proposals of the plan, and to determine how far its standards would be applicable in the event of a really significant reversal of the present trend of urbanization.

The outline road proposals, or something very like them, would almost certainly be required for the effective distribution of traffic to the City and to the industrial areas, and for the by-passing of central areas on the national routes of which London is so often the junction. A loosening of the texture would help enormously to give space for the proper detailing of both the "A" and "B" ring roads and of the main radials.

The open space proposals of four acres per thousand of the population in the County itself, with an additional three acres on the outskirts could, with lower over-all densities, be realized entire, without the necessity for schools and athletic clubs to travel 10 miles or more to find their playing fields. The plan recognizes the temporary nature of the compromise it suggests; and a basic change of policy would only hasten its ultimate objectives in this respect. The proposals now embodied in the Education Act of 1944 demand much greater space for school purposes than is allowed for in the London plan; but here again the point is made that the objectives may not be practicable at present.

The location of the industrial areas is unlikely to be much altered. The plan shows how closely they are tied to the rivers and valleys, the canals and main railway networks. Besides the central and the lower Thames dock industries there are clearly marked locations in the Lea Valley and by the rivers Darenth and Cray, Roding,

LEFT: Aerial view of the proposed satellite town of ONGAR. It is planned to contain six distinct neighborhoods, each accommodating about 10,000 people, and each roughly enclosed by a main artery or loop road

BELOW: Aerial perspective of Ongar as seen from above the community center. From this building (lower right) walks lead across the green to village and church. Beyond, the shops buildings, apartments and houses in distance

OPPOSITE PAGE: view of the shopping center in one of the neighborhood areas. A bus route runs along just to the left of the area shown. But this group of buildings is planned for pedestrian traffic only

Ravensbourne and Wandle. The western industrial sector lies across the roads, railways and canals that join London to the industrial Midlands and North-West. The greatest benefit of central clearance would probably be the provision of more convenient extension space for Thames-side industries, and of better amenities for the workers, including some buffer belts of open space between residential and industrial areas.

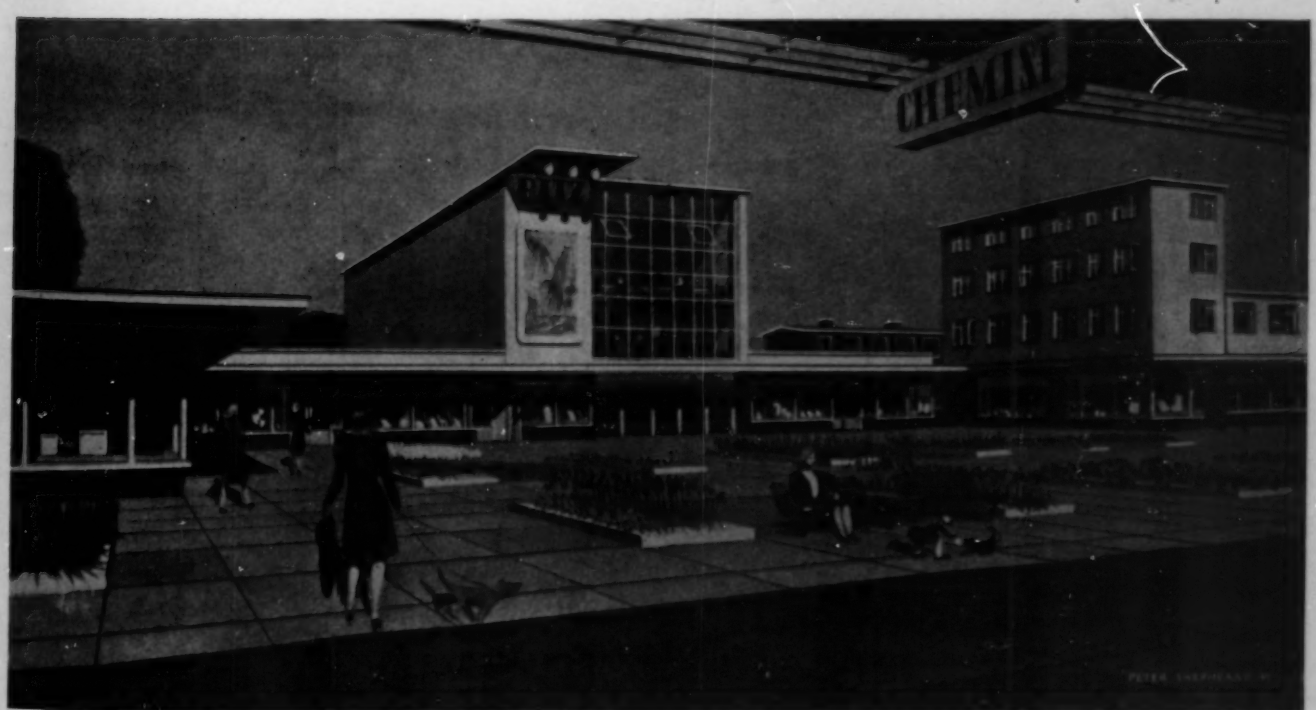
The Density Zone System

Last but not least, the residential density standards. This is the most vital calculation of all, and the one that has been most violently attacked. The plan proposes a comparatively small density zone in the West End — mostly composed now of hotels, blocks of flats and tall terrace houses — where the maximum number of persons per acre of housing would be 200. (This might be exceeded in places but would be compensated for by lower densities adjacent, so that the average would not be above the stated figure.) The inner boroughs are similarly zoned at 136 persons per acre, and the remaining half of the County area at 100 persons per acre maximum. These density zones are calculated to give varying proportions of apartments to family houses. In the 200 zone there would probably be no houses at all; in the 136 zone a third of the population might hope to be accommodated in houses; and in the 100 zone, 55 per cent.

An actual improvement of standards might call for the reduction of the 136 zone to 120, and of the 100 zone to 75. A strong decentralization policy would probably call for a slight reduction in the area of the 200 zone, and a considerable reduction in the case of the 136 zone. It would also call for stricter control of small rebuilding schemes, forbidding them to go up to the maximum of the zone if existing buildings at even higher densities were included in the neighborhood.

Thus it will be appreciated that the County of London plan is a fairly adaptable instrument. It is true that its compromises place it at the mercy of any crisis, such as the present housing shortage, which would make a strict interpretation even of its moderate proposals for the transfer of population administratively unpopular. It cannot be held as a flaming torch by the vanguard of the Garden City movement. And it is terribly vulnerable to delaying tactics.

Nevertheless, having regard to the other features of the new economic policy which has emerged in postwar Britain, this plan may prove in the end to be something less inspiring but more useful than a torch. It may be a suitable vehicle for the twin principles of social reorganization and improved living standards, carrying them through the days of scarcity and wartime convalescence, to the period when the major policies concerning national planning, compensation and shifting land values have been clarified by discussion and legislation, and large-scale physical reconstruction can be got under way. If even this is achieved, the County of London plan will remain as a landmark in urban history, possessing something of the quality of the famous plan for the City of London drawn up by Wren in 1666, though different in its scope and in its idiom. The Greater London plan is an advance along the same line; and this itself is proof of the usefulness of the Abercrombian method of approach. Time will now tell, and tell quite soon, whether it will be adopted and improved upon in practice, or whether it is even yet too simple for us to appreciate.



BARBARA MORGAN Photo

LE CORBUSIER

PLANS FOR THE RECONSTRUCTION OF FRANCE

In January of this year Le Corbusier was in America as president of the French Mission for Urbanism, Architecture and Cultural Relations, which had been sent by the Ministry of Foreign Affairs. Before a joint meeting of the American Society of Planners and Architects and the International Congress of Modern Architects held in New York City on January 30, M. Le Corbusier gave an account of the development of the spirit for the reconstruction of the devastated regions of France "conceived as a glorious adventure of architecture."

"Amid difficulties that can scarcely be imagined, under the most demoralizing living conditions, and amid cold and hunger," he declared, "the French have yet decided to discover a reason for living, an explanation for a mechanized civilization; and they are determined through architecture and urbanism to give to the man of today that equilibrium through which a new joy of living may be achieved."

DURING the long, bitter years of the occupation, France, though prostrate, never yielded in spirit to the conquerors. Behind the scenes, the scientists and the builders were formulating plans for the rebuilding of France, not along traditional lines, but in a manner compatible with the world of today. In organizing the work of this group, one of the leading figures was Le Corbusier.

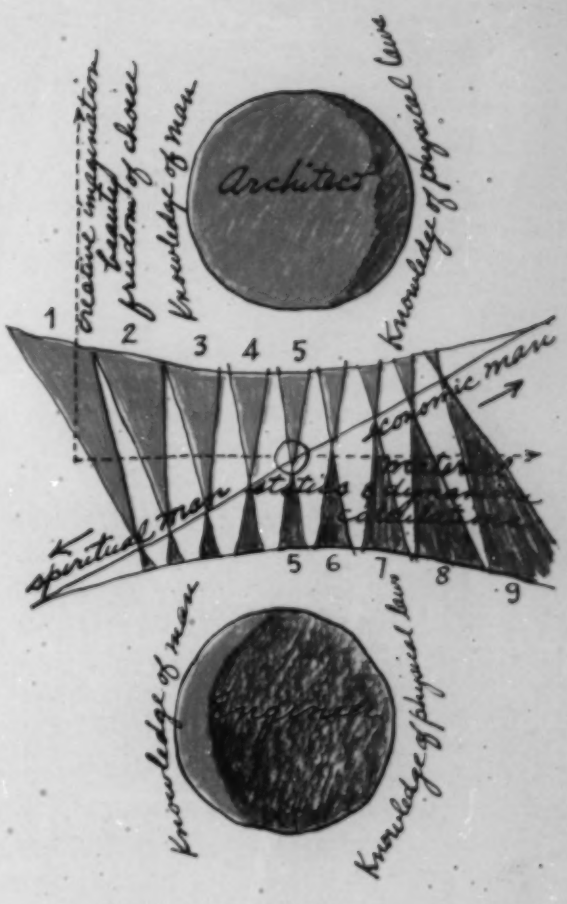
Enlightened thought and planning are to be applied by this group in the development of the work of replacing the countless devastated cities, towns, villages, so that the faults of the ante-bellum world will not be perpetuated. For the purpose of preparing the schemes to be used as the master-plans, an association of professional architects and engineers, with scientists, economists, educators, lawyers, sociologists, philosophers, was formed, "L'Assemblée de Constructeurs pour une Renovation Architecturale," familiarly called ASCORAL.

To symbolize this group as "Master Builders," Le Corbusier created an insignia — an arrangement of two circles, one above the other, separated by two horizontal curves, the space between the latter being traversed by a diagonal. In diagrammatic form this represents the two types of minds that must cooperate on the development of a practical and, at the same time, esthetically satisfying solution of any building problem.

The upper circle represents the architect, while the lower represents the engineer. By a wider interpretation, with the architect are included all those other categories of specialists concerned in the study of a complex problem whose knowledge is based primarily on man and his needs, such classes being the sociologists, philosophers, educators, etc., the object of whose activity is to achieve a product that will minister to man's comfort, serve his convenience, and fulfill his need for pleasant surroundings in which to work and live. With the engineer, in like manner, are grouped the scientists and economists whose knowledge is based on physical laws, and whose purpose is to achieve efficient operation in a design that is economically feasible.

These two spheres are not conceived as working against each other, but rather as operating together in varying degrees to illuminate the solution of any problem. The various types of building are ranged along the horizontal scale, with those in which the esthetic considerations and material constraints predominate on the right. At the center is the home. The diagonal passing through the center is conceived as composed of two arrows, the one to the left directed toward man concerned first with things of the spirit, the one to the right directed toward man concerned with economic and material necessities. In all problems, be it noted, there is need for some activity by the architect and some activity by the engineer. The triangles above and below this line for each type of building represent the proportion in which esthetic and practical considerations will determine design.

Since the blending of the esthetic and the practical is so clearly expressed as the avowed purpose of ASCORAL, and of Le Corbusier, its prime exponent, this, once and for all, should put an end to a misconception that has persisted for years regarding Le Corbusier's aims. Although he is generally credited with having originated the phrase that a house is, or should be, a machine to live in, his intention obviously was not to demand that a house be nothing but an agglomeration of bare walls, with windows and doors spaced in accordance with fixed scientific principles, merely to enclose the various machines, appliances and articles of equipment we have come to regard as essential parts of any building. On the contrary, he maintains that a house must add up to more than the sum of its parts if it is to be thoroughly satisfying to the whole man. Through regard of esthetic considerations only can this be accomplished, and the rules that he applies to an individual house he extends to larger studies as well — to groups of houses, to all varieties of building, to communities and to entire cities and regions.

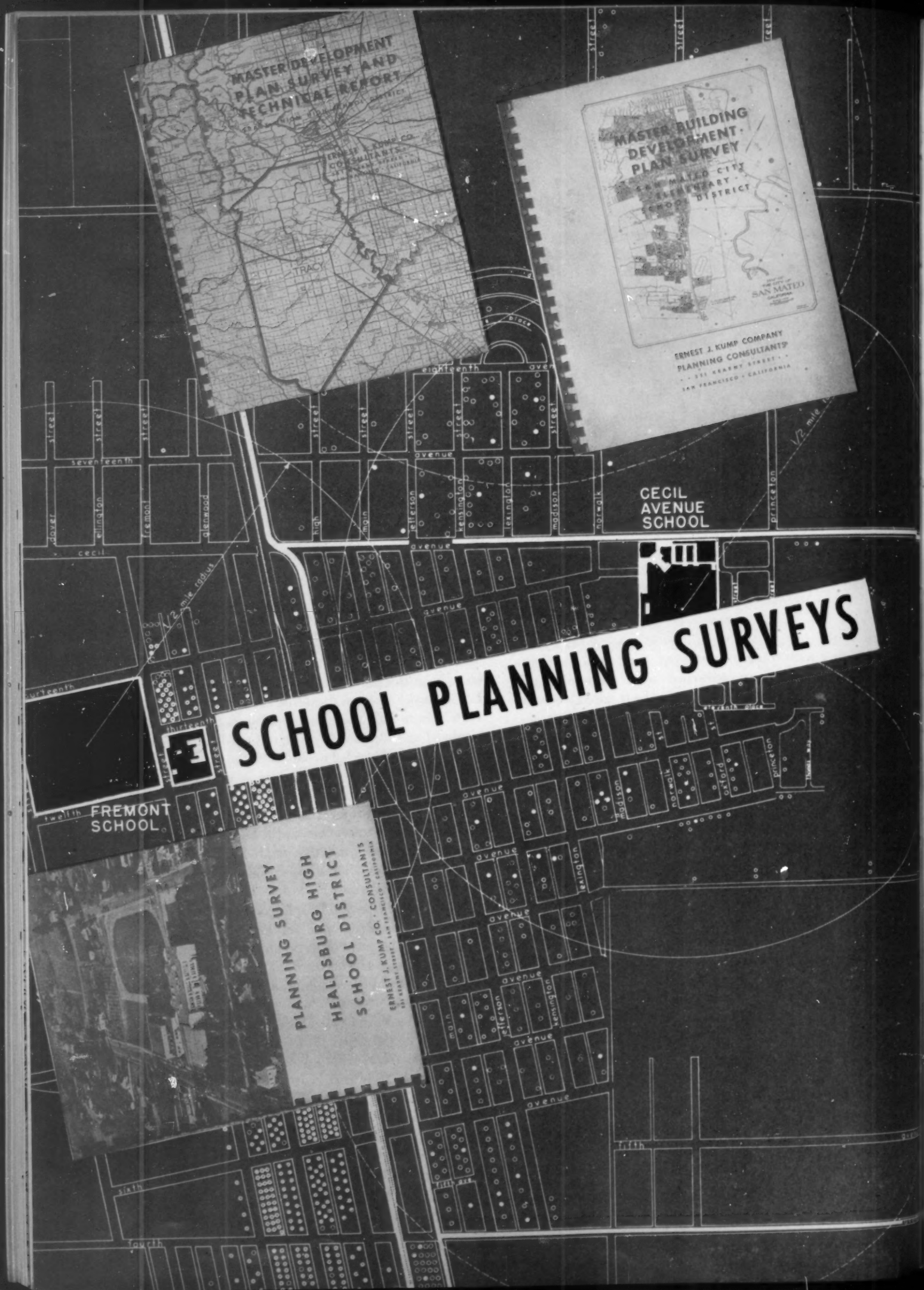


This philosophy, and his dreams of a reborn France, Le Corbusier has synthesized in his cover design for the March issue of ARCHITECTURAL RECORD. Green has always been the color of hope, and, in recognition of this, Le Corbusier stressed the desire that the cover be a "beau vert," for to him the green represents the hope of a revitalized architecture to serve the needs of his country, and the remarriage of urban areas with nature by the introduction of open areas and trees, which will liberate man from the tyranny of walls and pavements.

Many of the projects of ASCORAL are in an advanced stage of study. One, at St. Dié, is scheduled to be undertaken some time this year. M. Le Corbusier is preparing an exposition of this project for publication in an early issue of ARCHITECTURAL RECORD.

France had a profound influence on America during our Revolutionary period, for French writings largely inspired our ideas of liberty and freedom, and many sections of the Declaration of Independence and of the Constitution were adopted from French political thought of the period.

The currents at work in France are likely again to extend their influence into our hemisphere. What is done in the reconstruction of France during the next few years may be of the greatest significance to everyone in America. The work about to be performed is unparalleled in its scope, and it may well result in an entirely new conception of urban design. Le Corbusier was a pioneer of one revolution in design: he may be preparing another of even more far-reaching implications. The developments will be interesting to watch.


MASTER DEVELOPMENT PLAN SURVEY AND TECHNICAL REPORT
TRACY
ERNEST J. KUMP CO.
CONSULTANTS
MASTER BUILDING DEVELOPMENT PLAN SURVEY
SAN MATEO CITY ELEMENTARY SCHOOL DISTRICT
SAN MATEO
ERNEST J. KUMP COMPANY
PLANNING CONSULTANTS
SAN FRANCISCO · CALIFORNIA
CECIL AVENUE SCHOOL
FREMONT SCHOOL
SCHOOL PLANNING SURVEYS
PLANNING SURVEY
HEALDSBURG HIGH
SCHOOL DISTRICT
ERNEST J. KUMP CO. · CONSULTANTS
SAN FRANCISCO · CALIFORNIA

SCHOOLS

Architectural Record's Building Types Study Number III

Occasionally the study of an architect in action can be highly significant. His methods of work may contribute even more to the development of his field than his completed results. THE RECORD thinks this is true in the case of the West-Coast architect and school specialist, Ernest M. Kump, and his associates. The purpose and method which underlies the master-plan-survey method developed by these men speaks volumes for the trends in school work. THE RECORD is pleased to be permitted to give a step-by-step analysis of these methods, and to illustrate the study by means of the first *completed postwar schools* the firm has designed. Another part of this Building Types Study to which special attention may be called is the concrete proposal by Kenneth C. Welch for the systematic consideration of day-lighting and artificial illumination in schools as a single subject. For school heating we have turned to the considered proposals of our professional brethren in more arctic Canada.

THE ARCHITECT IN ACTION ON SCHOOLS

School planning survey methods of the Ernest M. Kump Company, reviewed by Douglas Haskell, Associate Editor

FOR THE clear-headed citizen there has been deep gratification in the best of our recent schools. In fitness, beauty and cheer they have stood in top place among our contemporary buildings. Even more gratifying is a new development, whereby the same clarity of purpose and design is being carried over into the planning of whole school *systems*. The reason is simple. The master planning for school boards is beginning to be done by the same people who have revolutionized the individual school plants.

If all architectural firms doing school work prepared the ground as thoroughly as Ernest Kump, there would be no need and no excuse for intermediaries. From these architectural advisers, the school boards are able to obtain a sound basis of (1) outlining a long-range program of educational requirements; (2) making a master plan spotting school sites; (3) setting up a series of steps to realize the plan by renovating existing school plants and building new ones. These steps are implemented by having (a) a detailed cost-breakdown in advance for all elements of the program and a "differential" supplied at any particular time bringing it up-to-date; (b) skeleton designs, initially supplied with the master plan, for the schools of the entire program; (c) detailed plans for schools ready to go; (d) building supervision; (e) advice on problems of maintenance and repair, taking advantage of the consultants' long experience in school buildings.

The great scope of work entailed in such full service involves *system* as the first prerequisite, and the outstanding characteristic of Mr. Kump himself is the ability, *by clear-headed analysis, to reduce intermediate steps to a routine*, so that attention can be focused on special problems and on *new creation*.

FRONTISPIECE. Three 1945 school planning reports of the Ernest M. Kump Company, superimposed on a typical chart taken from an earlier study. The planning technique is undergoing steady development, including methods of presentation

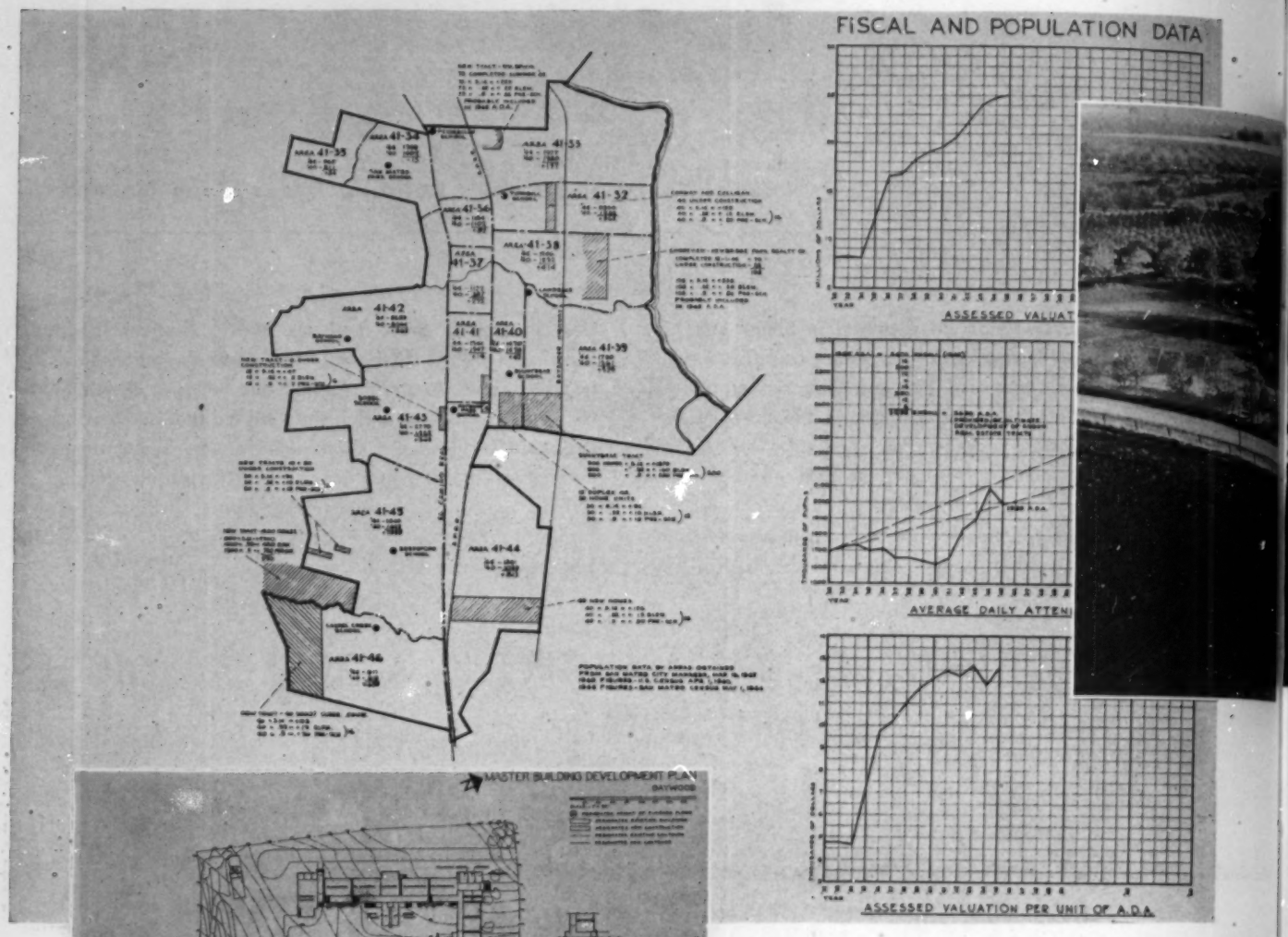
Major steps in producing a planning survey

The major steps, as summarized by his office, are:

1. *Conferences with the superintendent and board*, illustrating the approach to the problem through a Planning Survey. Convincing the board of the value of a long-term view of school planning.

2. *Executing a contract for a Planning Survey*. The fee is a fixed amount per child enrolled at the time of undertaking the survey. The rate is uniform for all elementary schools regardless of location; the high school rate is higher because of the greater complexity.

3. *Gathering materials and data:*
   a. Maps from county engineer, county or city school superintendent, government sources, commercial map publishers.
   b. Ordering air photographs, when required, either from government sources or as special takes by commercial photographers.
   c. Fiscal and enrollment data from district and county offices.
   d. Historical and factual information from school district records.
   e. Industrial, agricultural, economic background information from various sources. Zoning and transportation data from city or county planning commissions and other planning authorities.



TOOLS OF PLANNING AND PLAN PRESENTATION

Aerial photograph was specially taken for a plan survey. It shows a small rural school in Contra Costa Co., Cal., where a 14-room modern school will stand ultimately. Model at right helped explain construction to Acalanes School Board. The two maps are from reports to San Mateo Elementary School District, the larger showing trends, the smaller a school addition

f. Plans of sites and buildings from school files, county files, or State Department of Schoolhouse Planning.

g. Arranging to have site surveys made if none are in existence.

h. Making spot population maps where more than one site is involved.

4. *Organizing background materials*, writing the report, making graphs and tables. Interpreting spot population maps and graphic information.

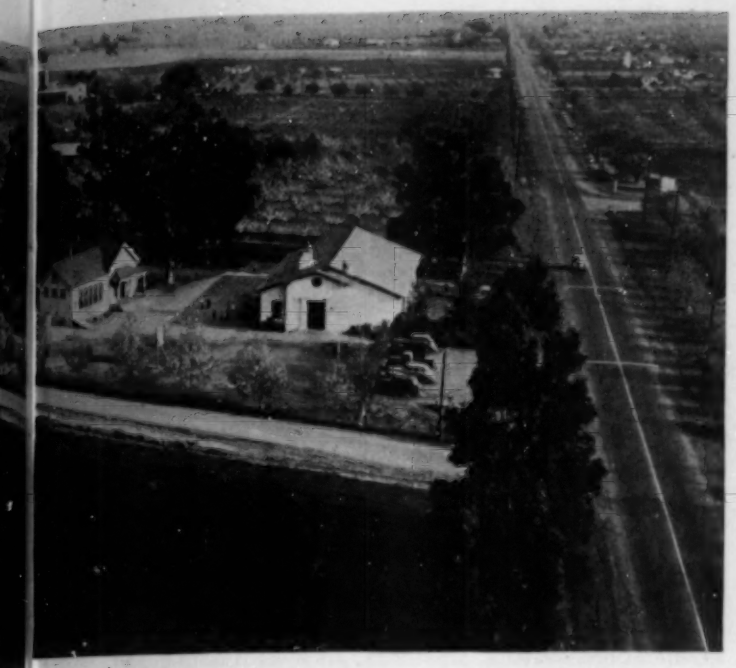
5. *Creative architectural work:* With all the facts at hand, devising various alternative solutions to the problems of development of the school plants and sites. Making site saturation plans.

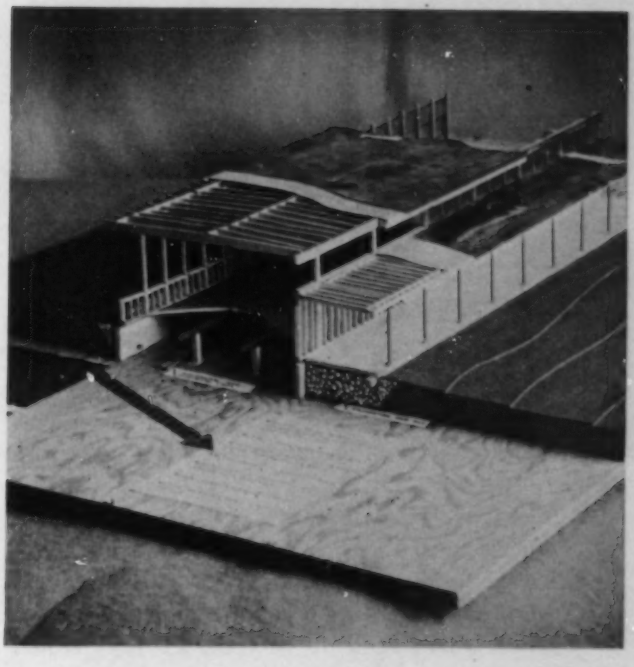
Mr. Kump especially emphasizes the fact that the choice of sites proposed for adoption is made with some idea of the finished school already in mind. In other words, the men who look at sites are trained to imagine schools on them. This is made easier by two important facts: first, that the men work as teams, every man being given preliminary training in basic understanding of the full scope of the work over and above his specialty; second, that each school, far from being a completely individual departure, is a combination of elements already under development.

6. *Conferences with the board and superintendent*, presenting the various alternative solutions. Fixing the Board policies and approving tentative proposals.

7. *Organizing the approved rough-draft solutions into final form*, making cost estimates, making finished site utilization drawings.

8. *Printing*, mimeographing, and binding the report.





9. *Presenting the completed survey* to the governing board of the district and effecting its adoption by resolution.

Very important, though not mentioned on this list, is the further architectural work with which every architect is familiar, of specifying materials, working with contractors supervising construction, and advising school boards on questions of materials and maintenance.

If the architects ever thought that they could gather all relevant school data by means of questionnaires, they quickly got over it. They did indeed prepare a succinct and exhaustive question form but they always send along a man to help get it filled out.

The question forms would be worth reproducing in full, in the interest of other professional men for whom the most important question of all is, what to ask. In the available space, I think it is more important yet to concentrate on the outline used for the ultimate report.

In any technical report, the marshaling of facts for clear understanding is as important as their correctness or fullness. With experience the Kump Company made significant improvements in organizing the material.

In the latest standard outline form (January, 1946), the main headings have changed considerably from those used as recently as December, 1943. Far less space is given to that habitual opening, a chapter on "The Existing School Plant." The facts about the past are there but most of them are subjoined to discussions of the future. A new, main chapter is headed, "Policies Significant to Planning." And in the course of "Recommendations for Plant Development," the latest reports all give their clients a beautifully succinct and direct explanation of "The Significance of Planning." In other words, in presenting the Board with such a tool as the Master Plan Survey, the architect-consultants do not fail to explain what the tool is intended to do, and how it is to be used. Failure to take the trouble to accomplish this has probably caused more master plans to be laid on a dusty shelf than any other single failure.

General Outline Planning Surveys

FOREWORD

A. EXISTING SCHOOL DISTRICT AND PLANT

1. General description of the District
2. District population trends
3. School attendance trends
4. Financial structure of the District
   - Assessed valuation and trends
   - Ability to finance schools and expansions
5. Existing school plant
   - Sites and grounds
   - Buildings
   - Transportation

B. POLICIES SIGNIFICANT TO PLANNING

1. The school program
   - Grade grouping
   - Community needs in curriculum
   - Adult education
   - Other policies affecting plant needs
2. The school as a community center
   - Service to community organizations
   - Health services
   - Cultural, social and recreational services
   - Other community services

C. RECOMMENDATIONS FOR PLANT DEVELOPMENT

1. The significance of planning
2. Functional characteristics of modern plants
3. Premises and assumptions upon which this MASTER PLAN is based
4. Stages in the realization of the PLAN
   (a) First stage
      Objectives
      Work involved
   (b) Second stage
      Objectives
      Work involved
   (Etc.)

D. PLANT DEVELOPMENT COST DATA

1. General information concerning costs
   Cost trends
   Basis used in computation
   Inclusions and exclusions in estimates
2. Estimates of cost
   (a) First stage
   (b) Second stage
   (Etc.)

E. EXHIBIT MATERIAL

(Usually bound separately)

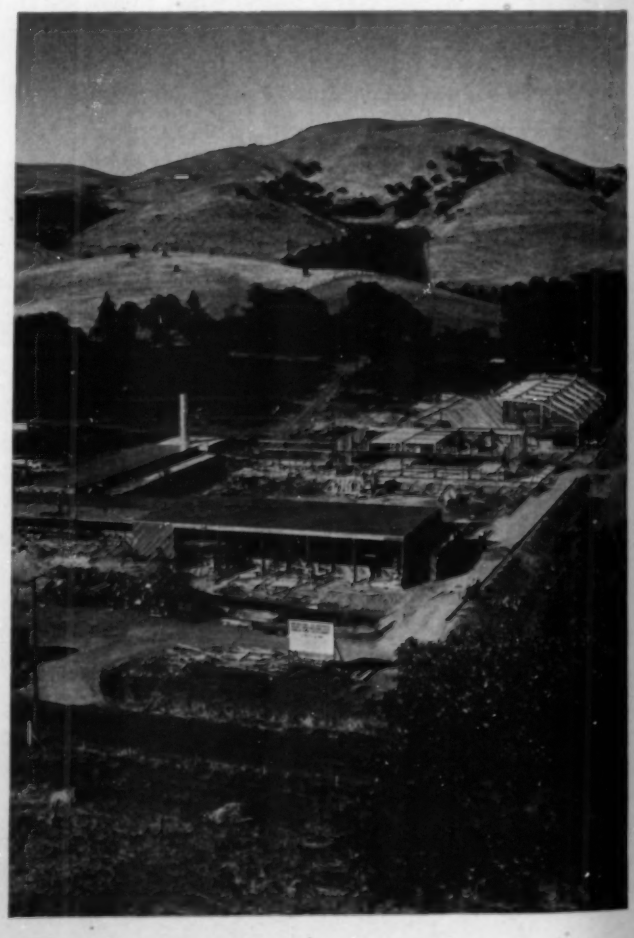
How is work systematized?

By high efficiency, the firm has been able not only to evolve a highly distinctive, clear-cut, and workable type of school, but also to insure its improvement through multiplication. The secret is the kind of work organization that systematizes routine and thereby releases creation. The systematized elements are:

a. Outline of steps to be taken
b. The complete questionnaire
c. Check lists
d. The formal outline for reports
e. Methods of presenting material to school boards. Reports are handsome mimeographed booklets in a gay red plastic binder, standard letter paper size (see frontispiece). Formerly "exhibit" material such as plans and tables (see page 96) was bound in. Latterly all exhibits are being issued separately, in a size 24 in. by 24 in., used alike for plans and photo mounts. (It makes no difference whether a picture is vertical or horizontal, for filing.)
f. Cost breakdowns. To make comparisons easy, the work is broken down into units — classroom, gymnasium, cafeteria, etc. — so that accurate forecasts can be made. As prices change from year to year, the school board can usually obtain the needed correction by simply calling up on the phone and being given a percentage differential. Cost estimates of this kind would of course be impossible if the component plan units were not reasonably standardized.
g. Plan units: The typical classroom, outdoor classroom, gym or multi-purpose room, swimming pool, cafeteria, etc.
h. Plan groupings. The most convenient arrangement for indoor-outdoor classroom rows is obviously like teeth (running east-west) on a comb, the backbone being a north-south connecting gallery. (See Acalanes School, page 99.) This having been settled, it is relatively simple to adjust to sites.
i. Structural systems. These will be clearly seen in examples, pages 100 to 107.
j. Heating, lighting, glazing, also shown in examples.
k. Equipment. Units were reproduced in AR Time-Saver Standards, June, '45; are seen in photos, page 105.

The chance for creation

Interestingly enough, the very fact that so much of the work is systematized and standardized has released energy for creation. The structure is on a grid. The frame is independent of the filler panels, so that the interior is a big "loft" space capable of being redivided in any manner. Structure does not interfere with plan, neither does heating. Openings, such as windows and doors, are removable, interchangeable. No educational equipment is attached to the structure, not even chalkboards. Equipment is developed independently. The ideal is that the teacher shall have nothing to do controlling light, heat, or ventilation, shall be free to teach; that the school board may change its program easily



when it pleases. Released from old-fashioned interlocking, each component part of the building can be developed on its own. There can be chosen a great variety of finishes and treatments. And the individual elements are constantly developing. Note, for example, that the 1938 Acalanes School has its corridor roof lower than the classroom clerestory, while the postwar schools shown herewith, though still bilaterally lighted, have a single continuous roof, which is simpler and better. In the earlier school, outdoor classrooms are mere open courts; in the later schools they are fully developed with shelters, planting, and benches.

Effect of large scale planning

"The school plant," says the Kump report to the trustees of Tracy Union School District, "is more than a school building; it is the sum total of all the educational facilities of a school. The words 'school plant' include not only the shell of the building with all its equipment, books and furniture, but also include such important matters as site, orientation, ground utilization, playgrounds, warehousing, provisions for transportation and feeding and for the most advantageous community use. All its parts are synthesized into a perfectly related and perfectly functioning whole. With the architect rests the major responsibility for the school plant after the statement of need and policy has been determined by the Board of Trustees."

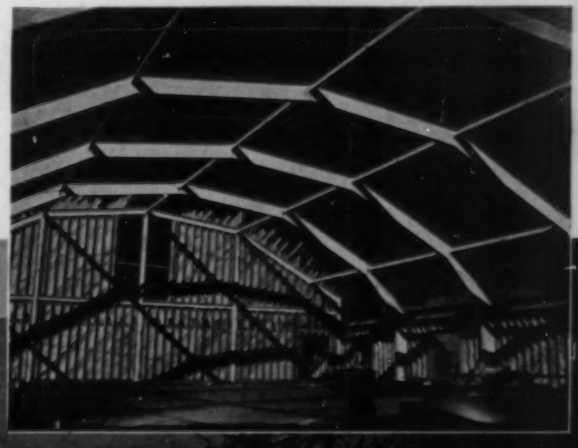
"The well designed school plant does more than passively house the activities of the school program. It can stimulate the teaching and learning processes by being easily accessible and creating a bright, open, inviting and healthful atmosphere, geared to the needs and tastes of the students; or it can thwart the learning process by being dark, heavy, monumental, inflexible.

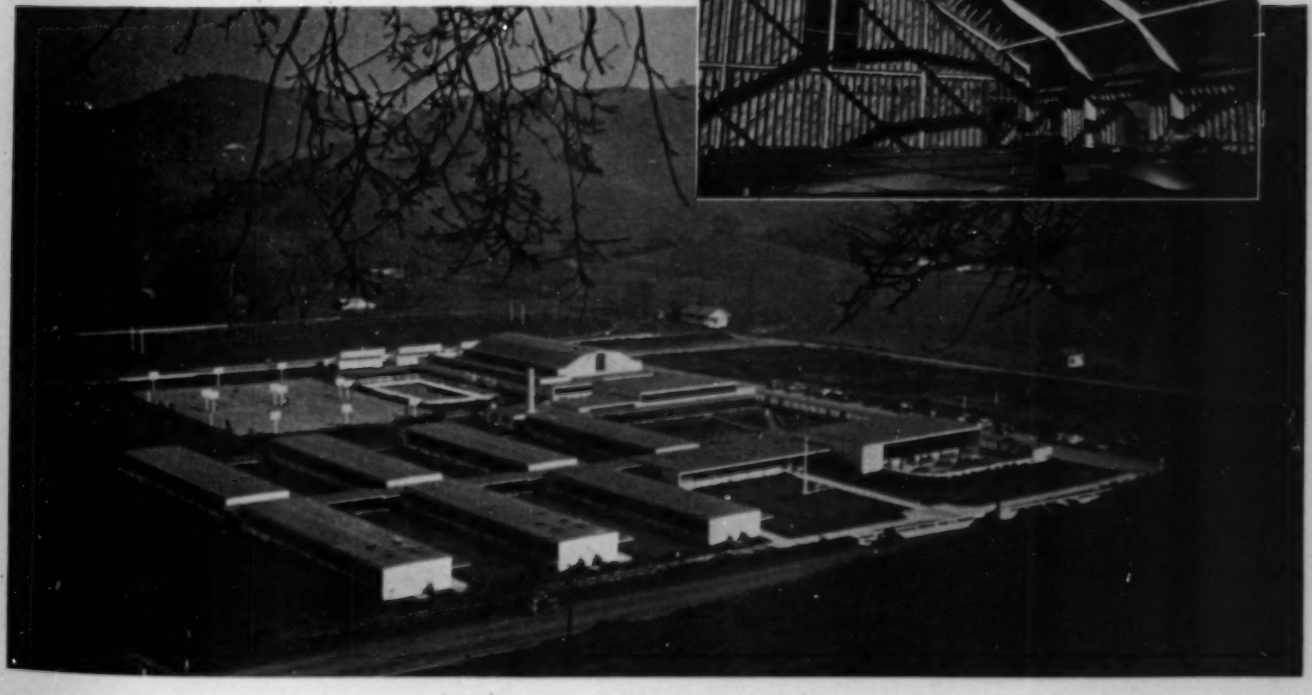
"The school plant belongs to the community; it is the answer to the community's needs, an expression in three-dimensional form of an aspect of the community itself. The Board should plan a school plant which derives its character from the nature of that particular community. Its form and arrangement should permit advantage to be taken of any climatic opportunity of the region; landscaping should be indigenous to the region; local materials incorporated into the design where possible."

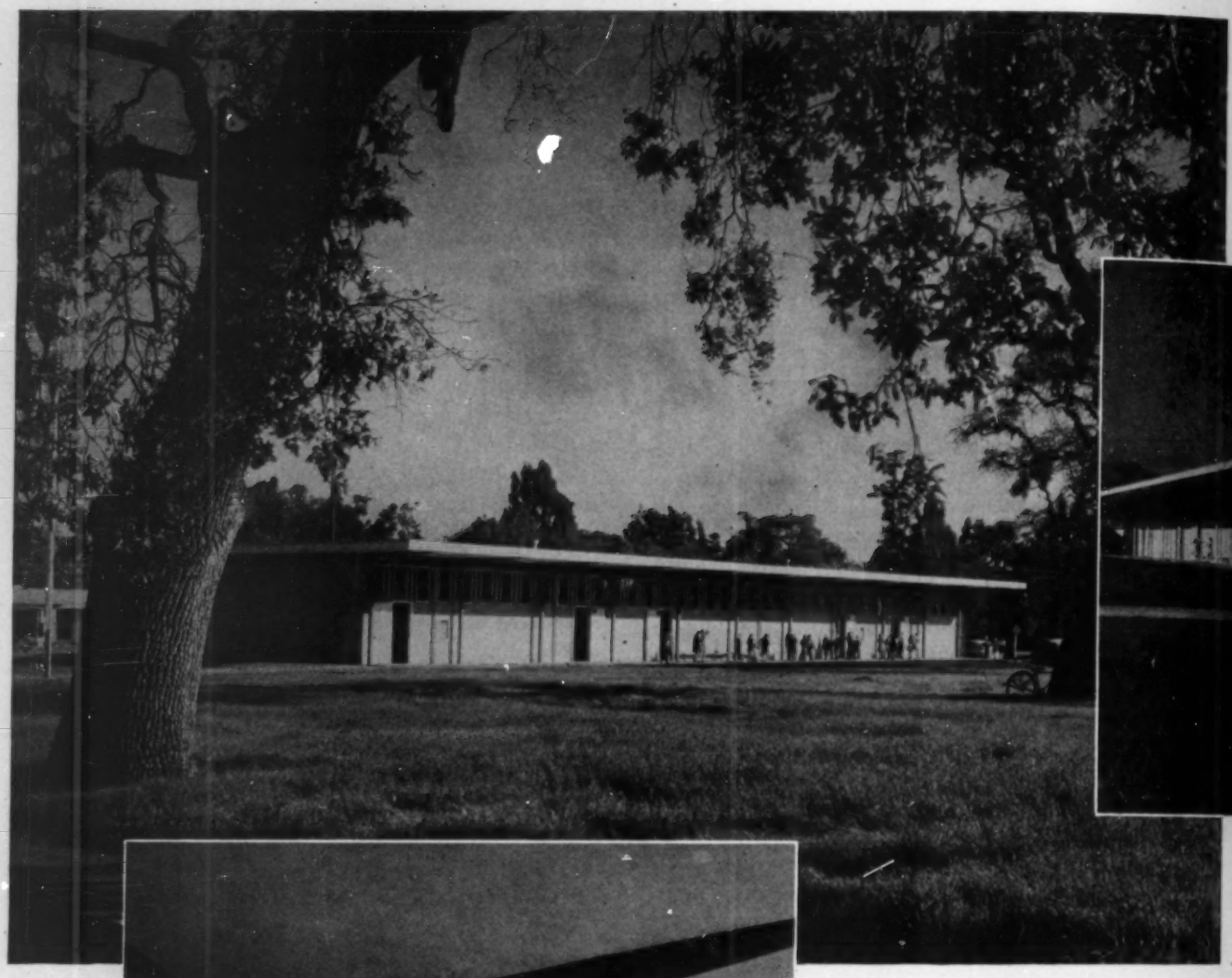
A set of principles is then set forth, on each of which there is given an explanation ranging from a paragraph to a page. In brief, they say that the school plant must be flexible, must be adaptable to community use, and requires an adequate site; that adequate lighting standards must be assured, along with adequate ventilation and heating.

This broad view of the subject has had consequences still broader than any that have yet been mentioned. By putting before the school board and the parents the cogent case for long-range, detailed, practical master planning, the architects have found that they have vastly increased the interest, every time, in long-range planning for the community as a whole — the future work of the architect-planner.

THE ARCHITECT-PLANNER'S WORK IS NEVER DONE so long as the school stands. Comparing the picture below of the "finished" Acalanes Union High School of today with first publication in the RECORD, *June, 1941, shows the filling out of a master plan by successive steps. Construction photographs imply a job of supervision by the architect to assure worthiness*





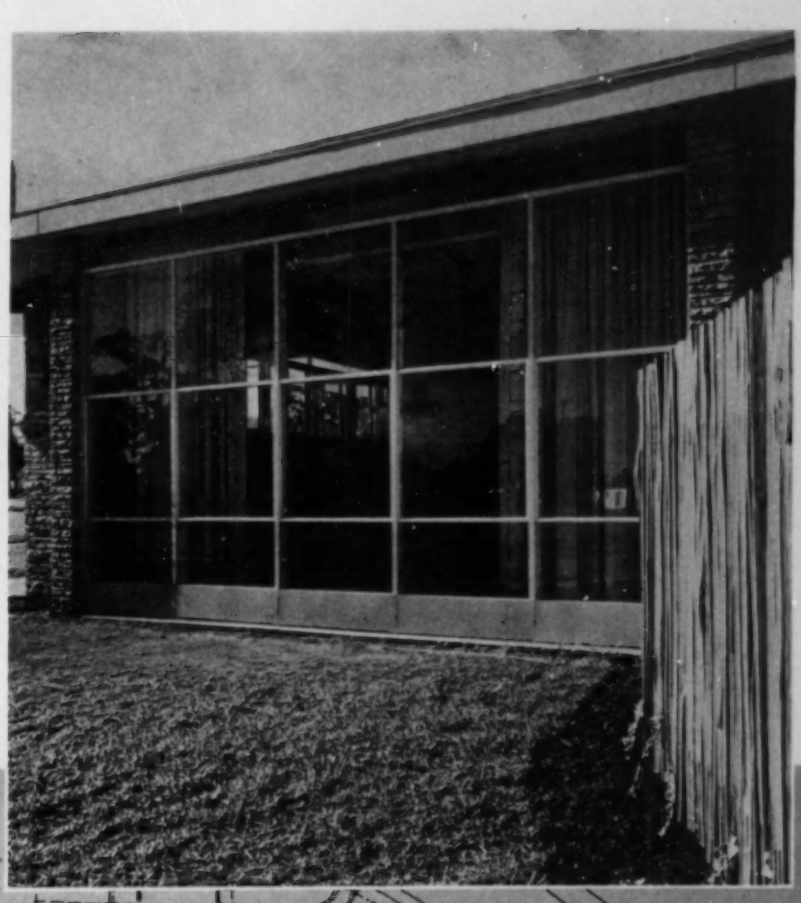


JOHN H. LOHMAN Photo

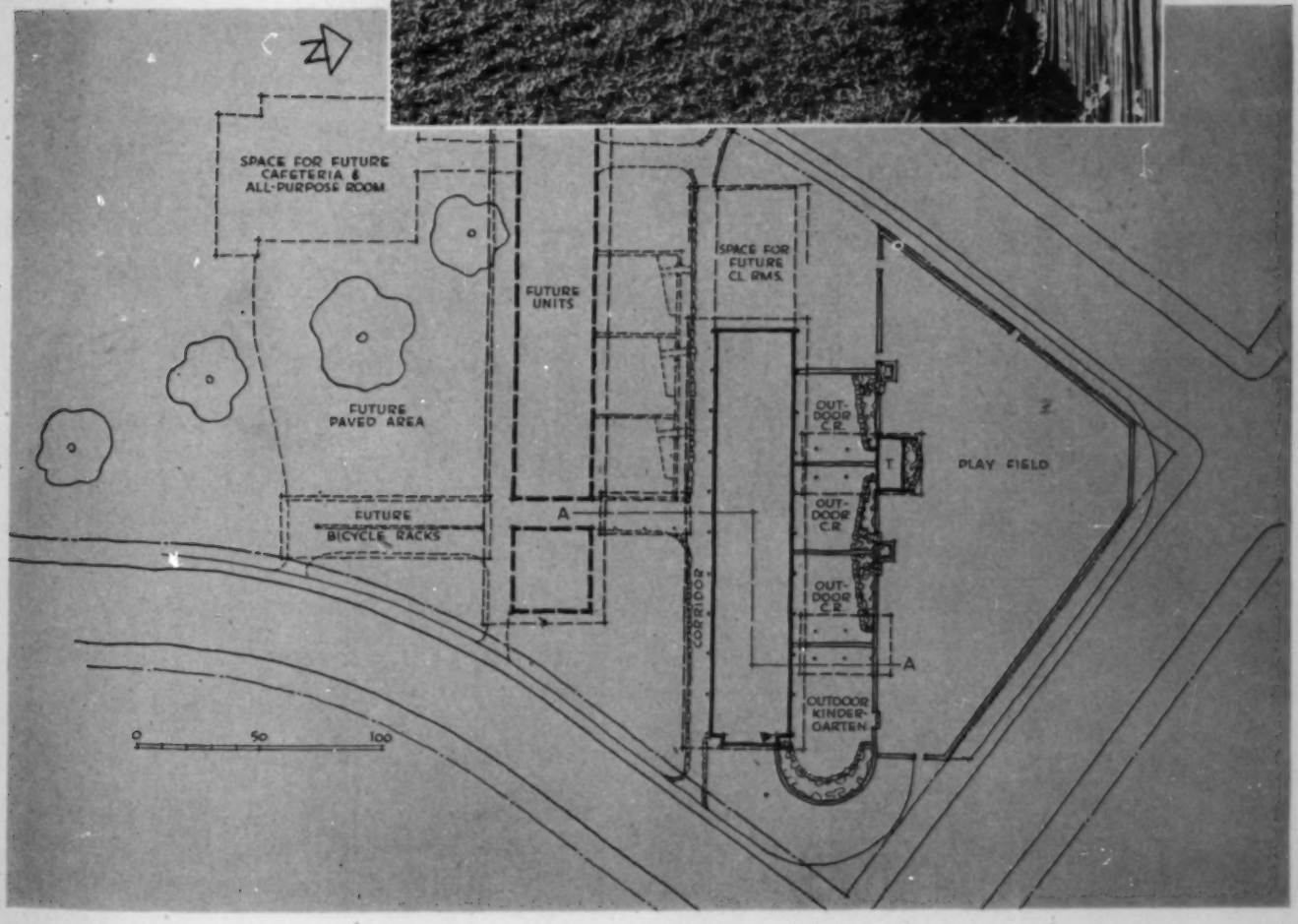
These two schools stand at the culmination of the architects' development to date. They are the first by this firm to use the new square classrooms of 30-ft. depth, made possible by ample bilateral lighting. They are the first to use fully developed outdoor classrooms with structural shelters, planting, benches. They are the first to use radiant heating by copper piping in floor slabs. View at left gives an excellent idea of the steel-frame construction of lally columns and beams; the patented welded connection gives bracing in both directions, so roof is supported entirely independently of any walls and interior space is a great loft. The use of field stone and split-cedar fence adds welcome warmth.

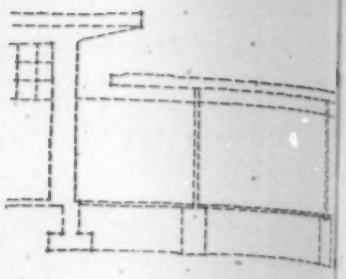
FIRST POSTWAR SCHOOLS

By Ernest J. Kump Co., Consultants, Architects, Engineers. White Oaks School, San Carlos; Sunnybrae School, California



PHILIP FEIN Photos

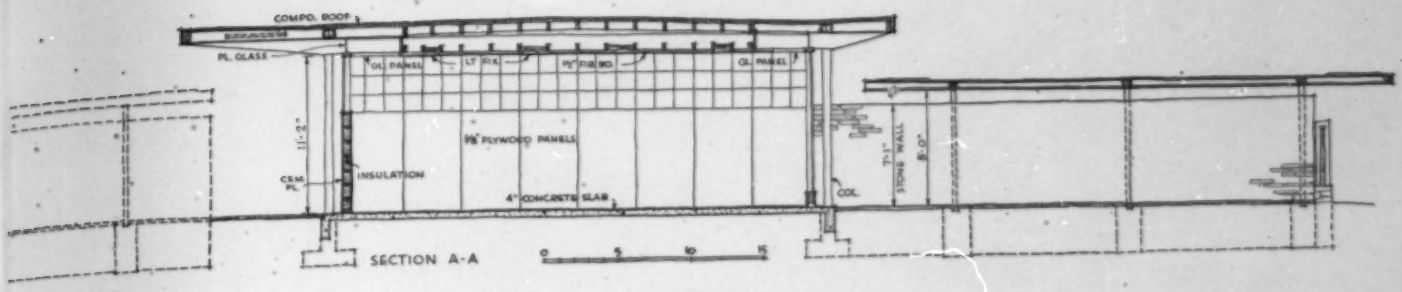




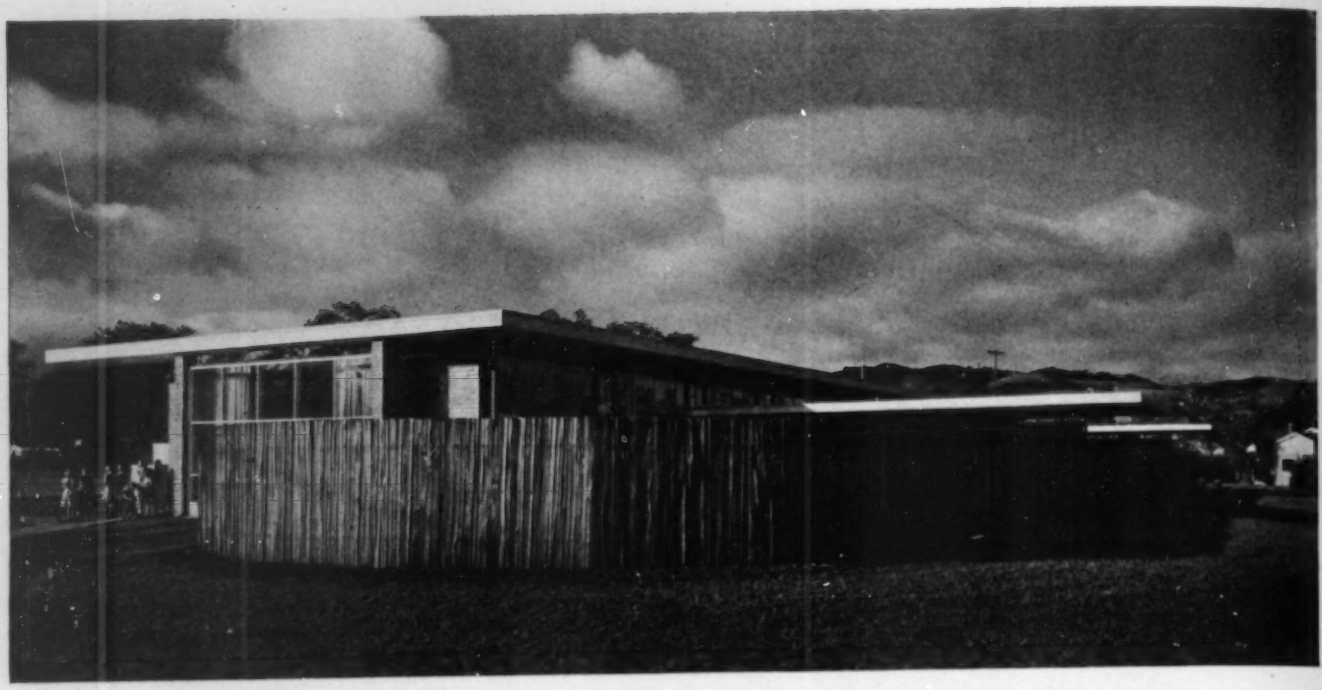
PHILIP FEIN Photos

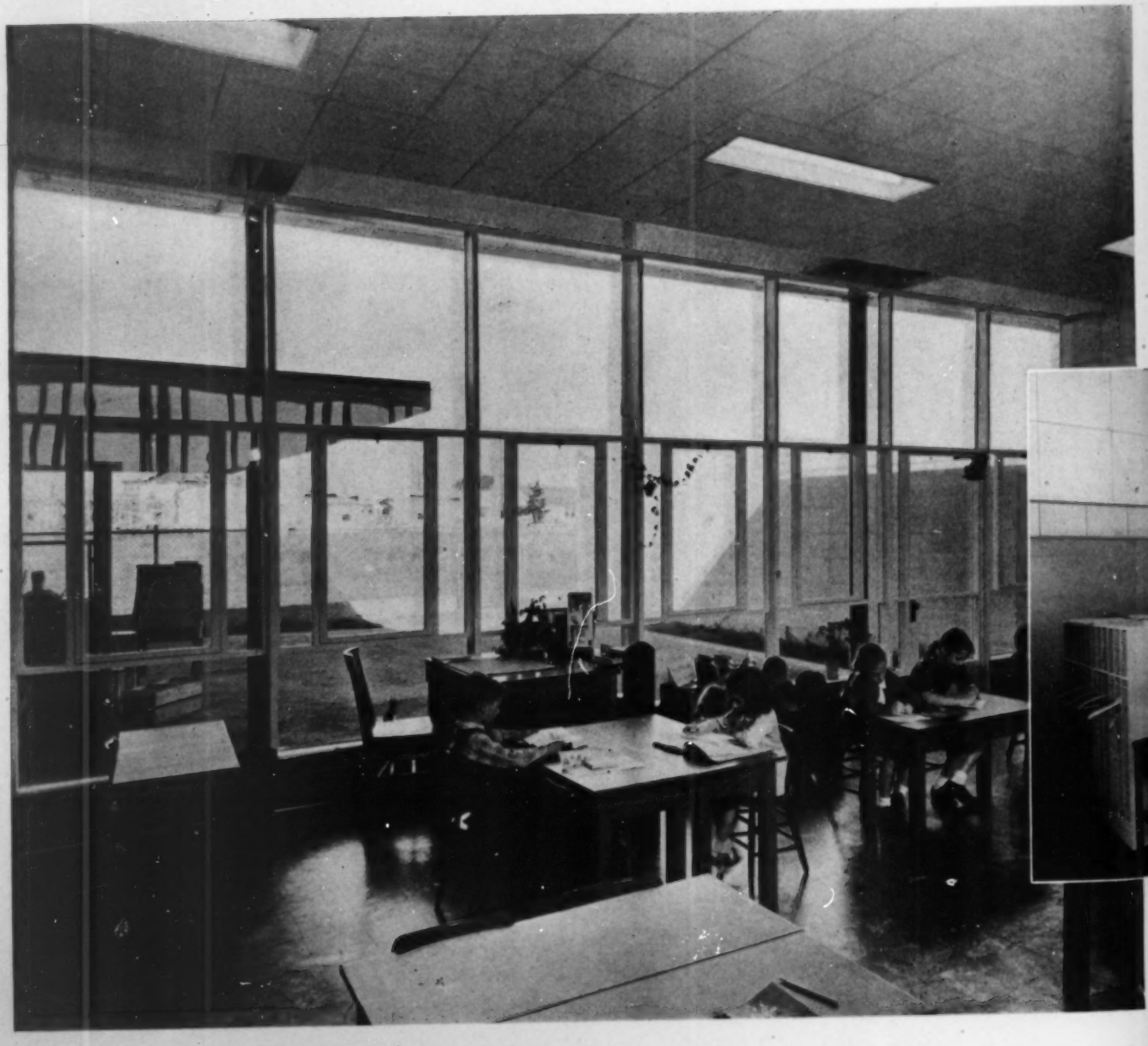
These views clearly indicate the wonderfully open effect of the space flow between indoor and outdoor classrooms, enhanced by a design method using free planes. These outdoor classrooms are the most complete development so far. Varied materials (field stone, split-rail, cement block, iron fence) enhance the textural experience of the children.

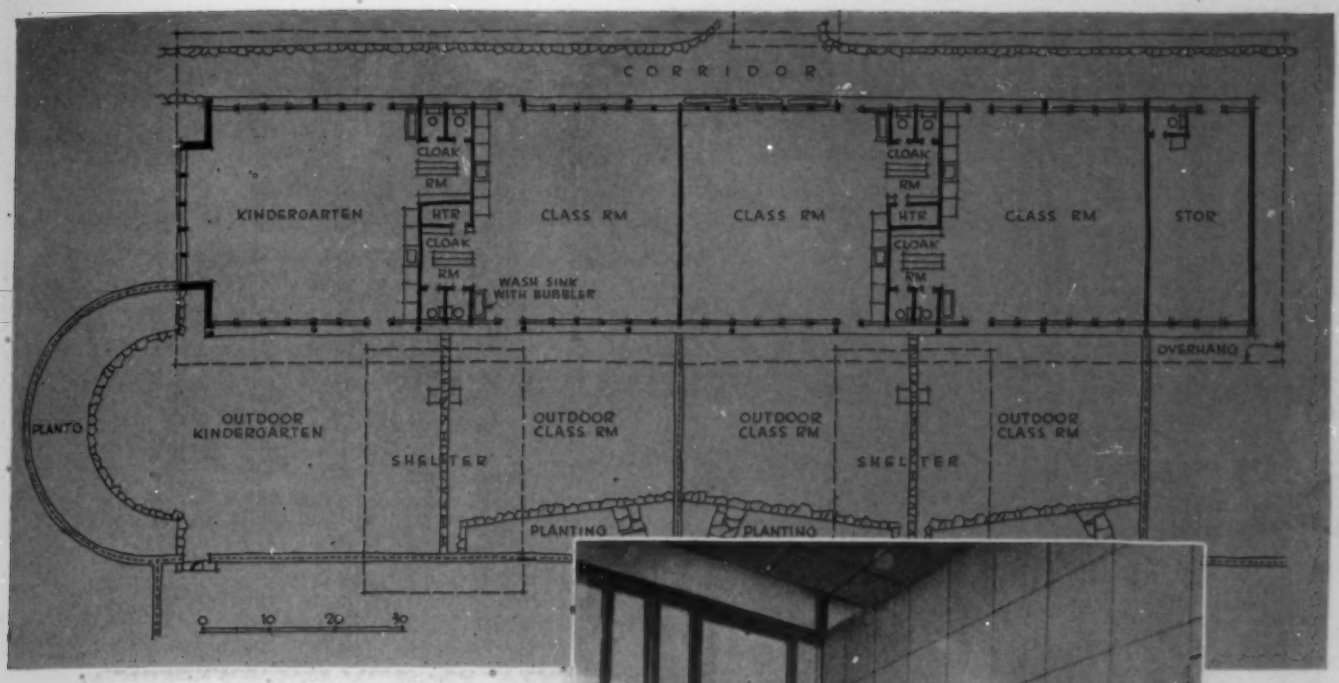
The simplicity of approach which leads to efficiency is seen in the use of a 2-ft. module for vertical as well as horizontal dimension variations. The fact that doors are 7 ft. high is taken care of by starting the 2-ft. dimensions from a 1-ft. table forming a base all the way around the structure. As room widths increase, ceiling heights are also raised 2 ft. at a time



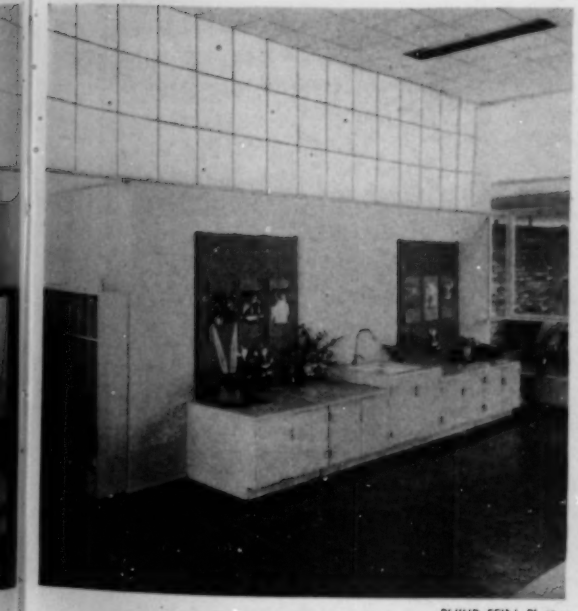
JOHN H. LOHMAN Photo





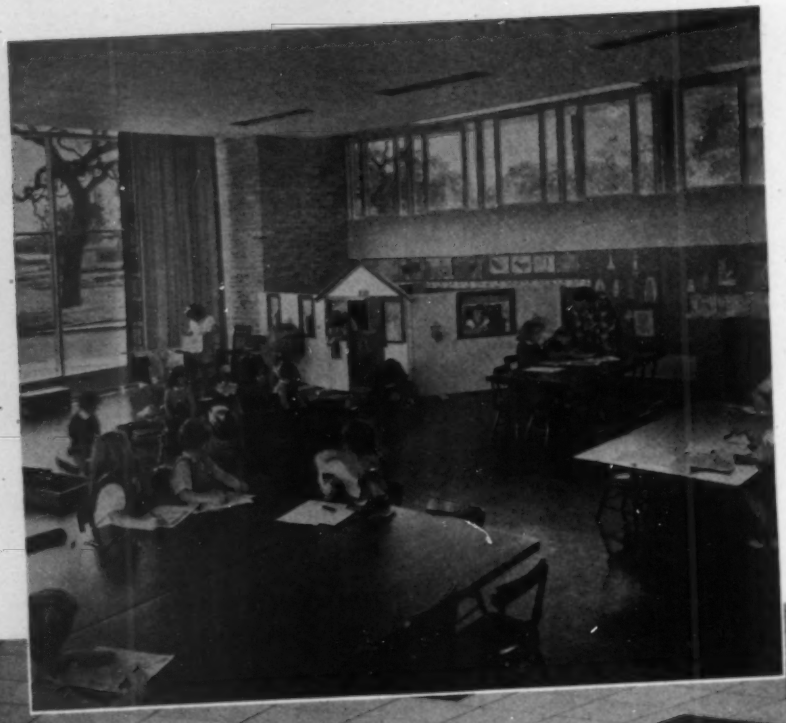


"No part of the educational equipment should be attached to the building structure" believes Ernest Kump. Here we see the famous standardized movable storage furniture, and the way it fits with removable partitions. Another Kump dictum is that the teacher should be entirely free to teach, should spend no time on controlling light or heat. In his next schools, the glass will be entirely fixed, cleaned air will pass through ducts and be heated or cooled by the radiant coils in the floor in accordance with the need



PHILIP FEIN Photos

JOHN H. LOHMAN Photo



Photographs at left and below show two sides of the kindergarten; those across-page were taken in a grade-school classroom. Both sets give a lively impression of the open spaciousness of the large rooms, intended to create extra "activity" space without the complication of extra alcoves and extra construction, just as the window arrangements seek to create lighting as nearly ideal as possible with a minimum of moving parts. The partitions between these rooms are bolted and movable; the doors and windows are completely interchangeable

PHILIP FEIN Photos

Rendering by WATKEYS

FIRST STUDIES FOR A MODEL SCHOOL IN NEW YORK

Oswego State Teachers' College Practice School, Oswego, New York

Lorimer Rich and Robbins Conn, Architects

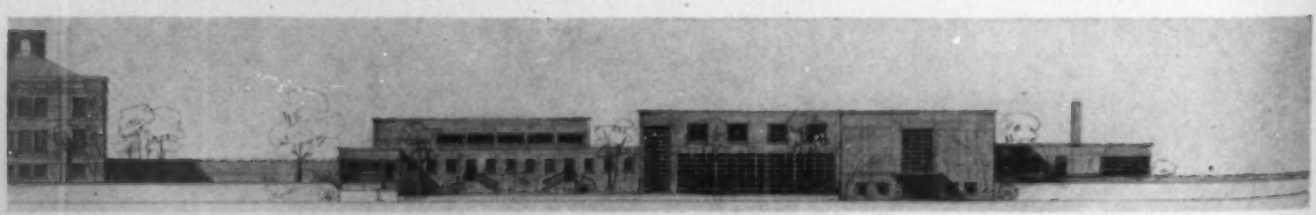
Studies prepared for the New York State Postwar Public Works Planning Commission

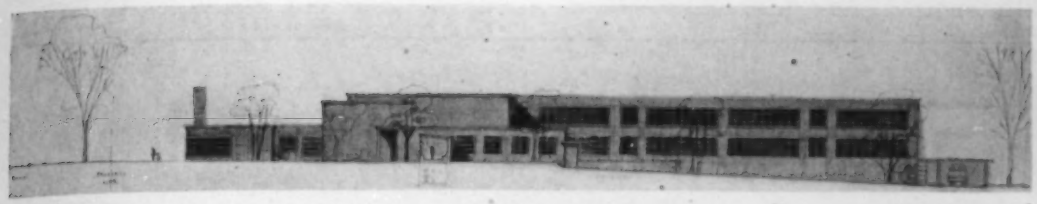
John E. Burton, Chairman; Ross J. Sluyter, Chief Architect; Cornelius White, State Architect

These preliminary studies foreshadow an interesting combination of adaptation and progress. To be located on the campus of the State Teachers' College at Oswego, the practice school will serve as a laboratory where young teachers may practice under observation, where experienced teachers may try out new educational theories before they are adopted in state-wide use.

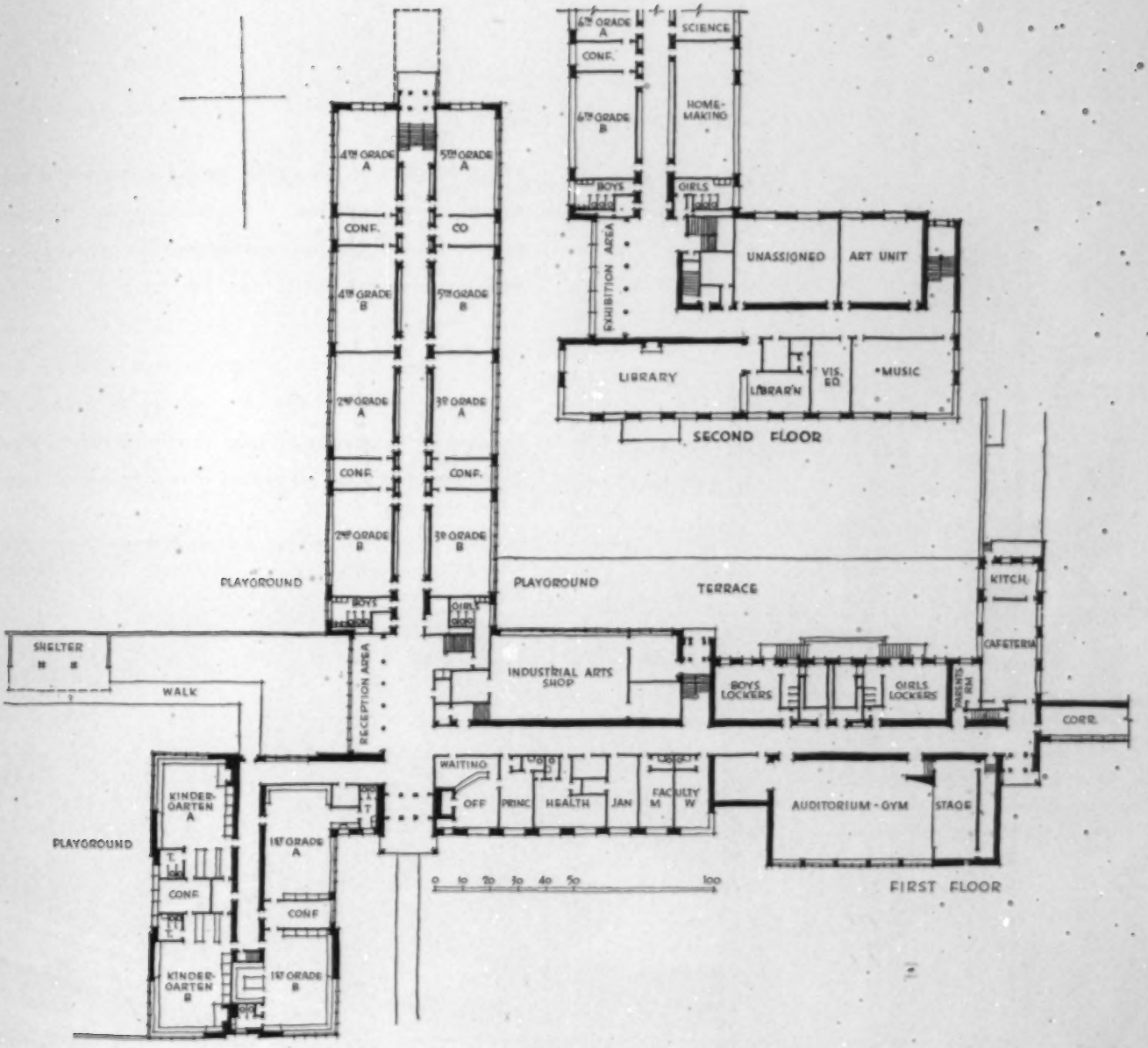
The requirements of practice and demonstration explain the incorporation of duplicate classrooms for each grade, connected across a conference room where results may be discussed. Thoughtful provision is made for teachers, pupils and parents — the latter being given a room of their own off the entrance. The east end of the building as far as the boys' locker room can be opened separately from the rest of the building, for community purposes. The cafeteria is being enlarged in further studies to seat 124 people.

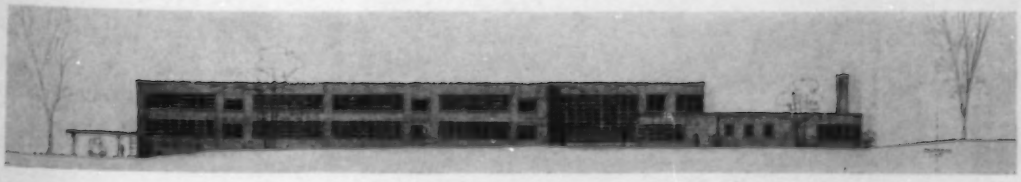
Classroom interiors will be made strictly up-to-date so that teachers may observe the effect in use of such advanced design as the use of sloping ceilings to reflect more light, of all-wood partitions to provide unlimited pin-up space, and other advanced features. The architect points out that there is nothing below grade other than pipes; the editors point out that the careful adjustment of the outward design to existing "stylistic" buildings is exemplary.





Rendering across-page shows western, entrance, side of the building; the elevation 'at left' is the southern preliminary study

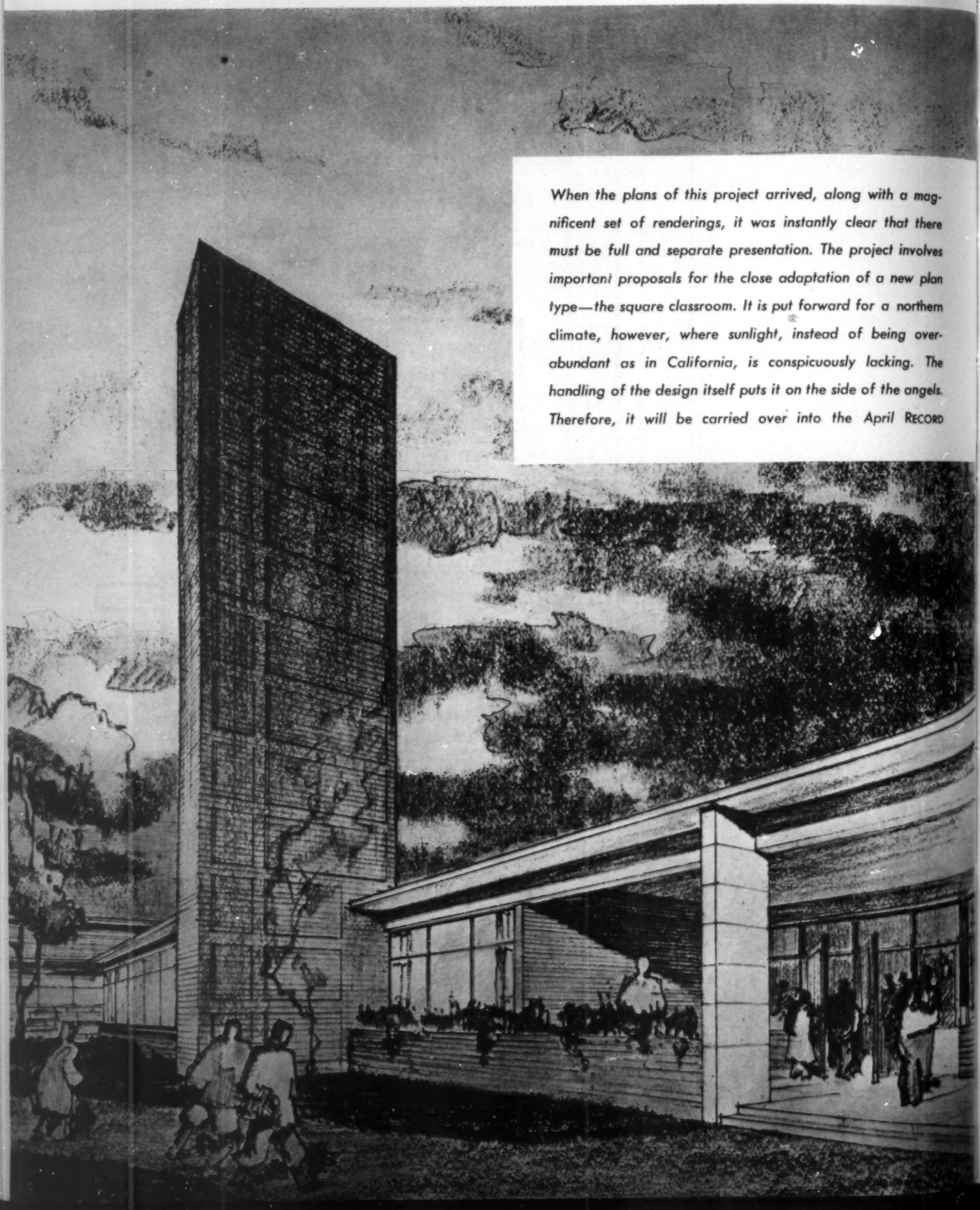




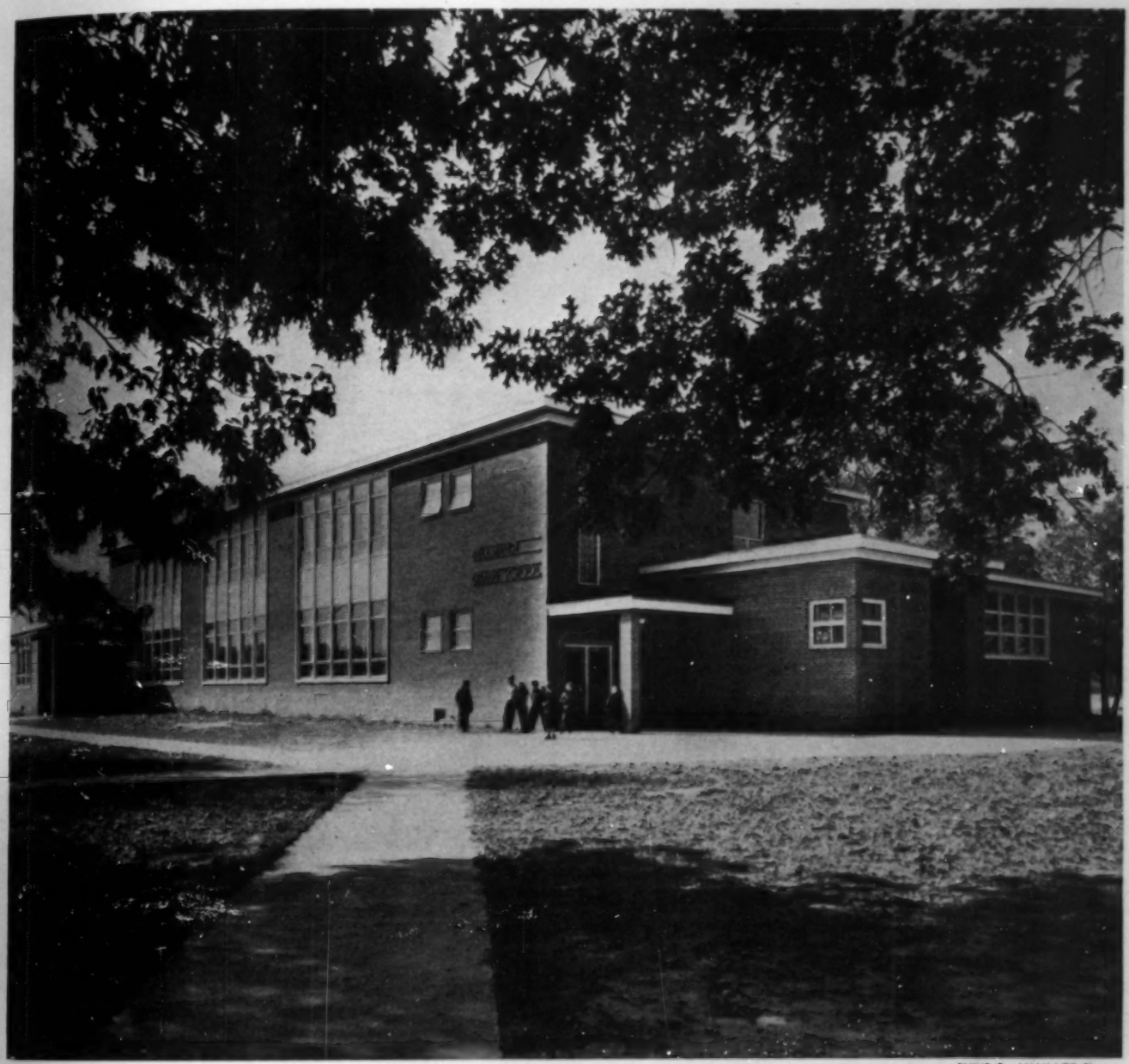
Across-page, western and eastern elevations in preliminary study; on this page, preliminary study for elevation of northern side

PACE-MAKING PROJECT FOR THE EAST

Perkins and Will, Architects and Engineers



When the plans of this project arrived, along with a magnificent set of renderings, it was instantly clear that there must be full and separate presentation. The project involves important proposals for the close adaptation of a new plan type—the square classroom. It is put forward for a northern climate, however, where sunlight, instead of being overabundant as in California, is conspicuously lacking. The handling of the design itself puts it on the side of the angels. Therefore, it will be carried over into the April RECORD



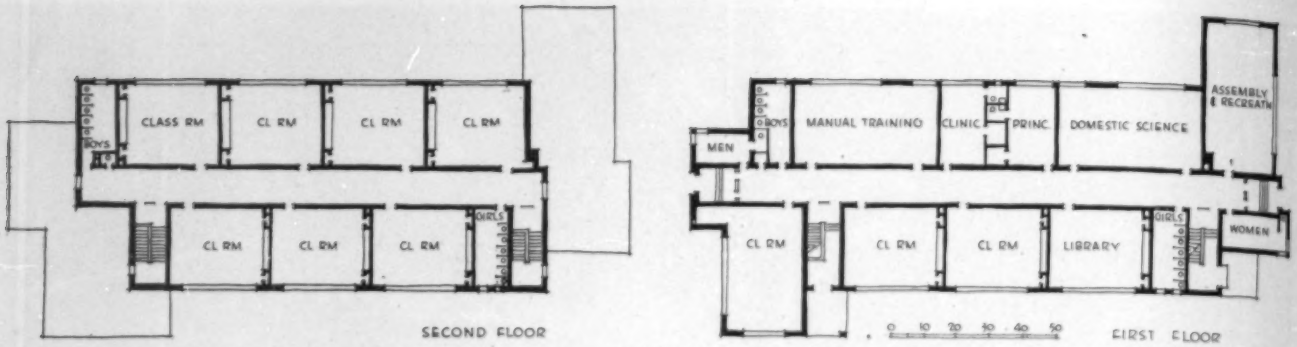
PHILIP B. WALLACE Photos

AVERAGE SIZE DONE WITH SPECIAL CARE

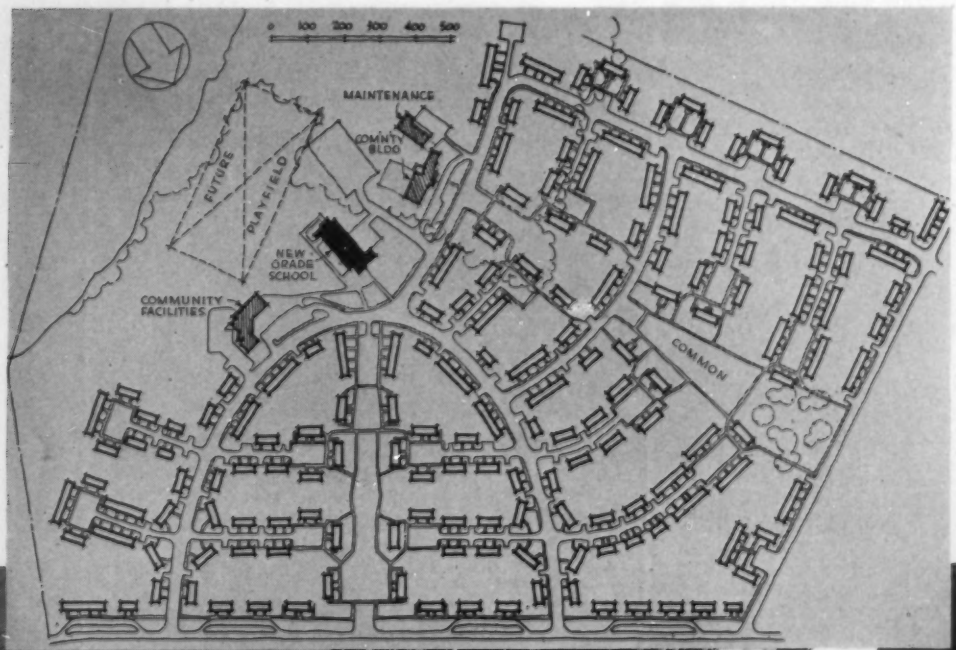
Bellmawr Grade School, New Jersey
Joseph N. Hettel, and Mayer & Whittlesey, Associated Architects

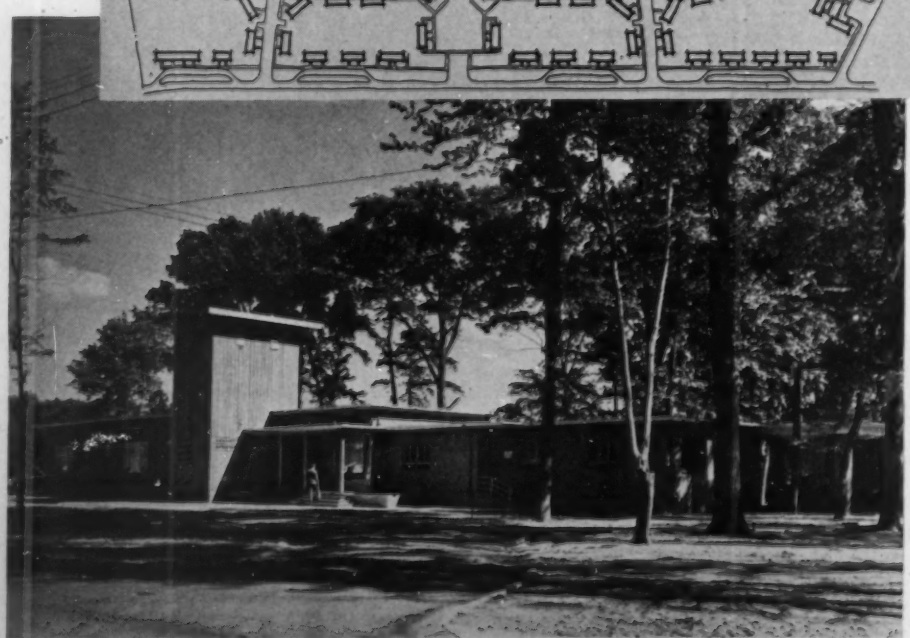
THIS war-built school, of typical size, is *not* just a single story high, and does *not* have an outdoor playroom for every indoor classroom. Yet it represents careful planning, construction, and finish. Indeed the architects deliberately asked permission to deviate from the FWA standard war requirements of single-story building. The reason was that a sprawling plan would have spoiled the limited area of surrounding land available for spacious playground development. Having gone to two stories, the architects had to use masonry to satisfy the State of New Jersey. To save steel (still a factor today) that would normally have been required to carry the intermediate brick spandrel, they devised the 2-story wooden window frames which characterize the exterior.

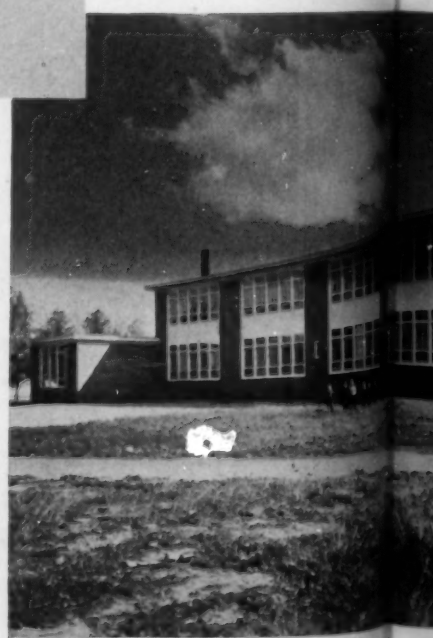
To give further interest to the building form, and save it from dead rectangularity, the assembly room and one small children's classroom were turned endwise.



Bellmawr Park is a war-built community; there are 500 families housed in the FPHA project of which the plan is seen below, and another 500 families in a privately built development completed later. The plot plan shows the care with which the school has been placed at the community center, off from main traffic ways. Rather than try for formal styling, the architects sought for an informal character of harmony with the community building (seen below) and the shopping center, which flank the school. The building runs north and south, classrooms face east and west







GOTTSCHO-SCHLEISNER Photo

COLOR was used with unusual effectiveness and care, at Bellmawr. No such range would ordinarily have been permitted as was allowed by PWA, although budget was met. The architects carefully assembled mixing directions for three shades each, of blues, greens, and hues running from red to yellow, plus brown and cream, white and oyster white.

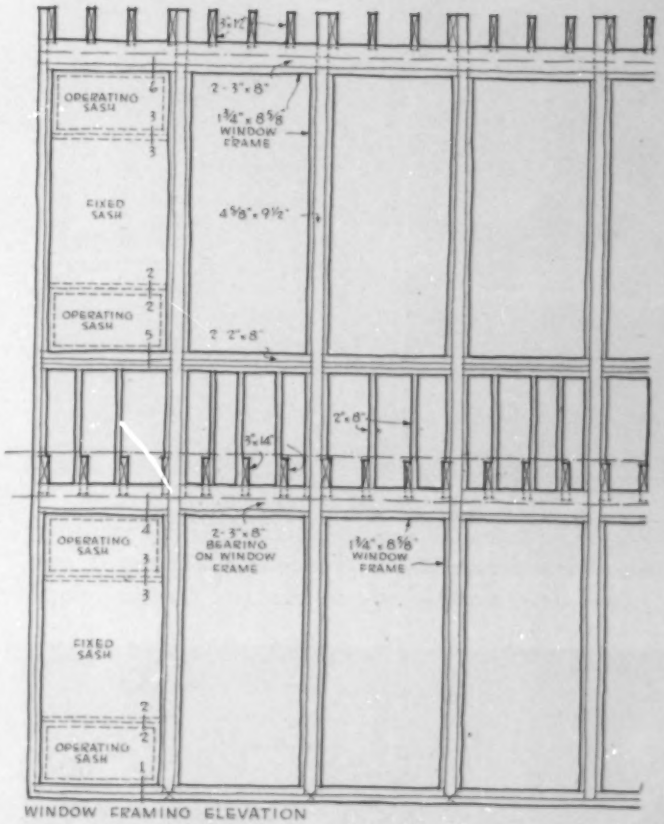
The principle was observed that the head wall containing chalkboard and tack strip should be a deep rich color, more restful to the eye than a blackboard in a highly reflective white wall. These deep rich head-wall colors are blue in four cases, and brown (rich and reddish) in five.

Inner and rear walls are made highly reflective — oyster white where headwalls are blue (both cool) and cream where the head wall is brown (both warm).

The inner wall has a blackboard and tack strip, the trim being painted with the wall, but the chalk rail a bright color.

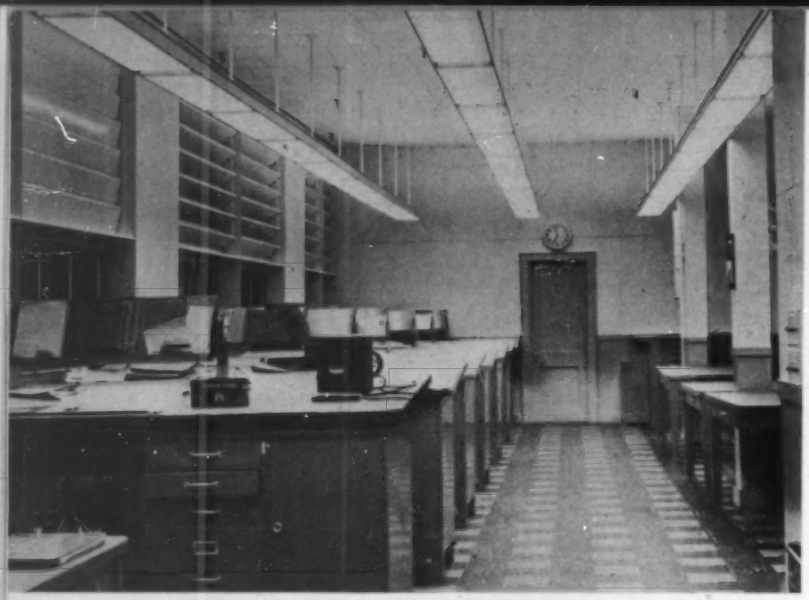
The window walls match the inner walls in color, except for sash left natural and varnished.

"Brights" have been inserted (yellow or green or medium blue), at the entrance door, the chalk rail for both blackboards (meeting entrance door frame) and clothes hanging recess in rear wall.



WINDOW FRAMING ELEVATION

Detail (right, above) shows the two-story framing system for windows, saving steel to carry either the intermediate masonry spandrel otherwise needed, or the head. Window frames are spiked to structural studs and support head pieces which carry joists. In photographs below are seen (left) the western side and (right) the eastern side of the school. Ventilation is by grilles in wardrobe ceilings and shafts leading to a large duct formed by furring down upper corridor ceiling. This duct discharges through large louver grilles at each end of the corridor and through continuous openings around entire soffit of the cornice



Above and below, planned brightness holds all main visual areas close to ratio of 3 with task. Low brightness of open louvers shows that they must be closed at night as reflector

Below, same room by day. Brightest area, the window louvers, is held down close to ratio of 3 with work. Inner wall is in need of supplementary artificial lighting to keep brightness even

APPLIED BRIGHTNESS CONTROL IN

BRIGHTNESS engineering" is the name that was given two years ago by Dr. Matthew Luckiesh to a concept which is rapidly transforming the thought of all the leaders in lighting. The "brightness" approach is concerned with more than merely "supplying enough footcandles for a given task." Brightness control seeks to recreate, in the whole interior environment, as nearly as possible, the most agreeable relationships in Nature. It chooses those which have proved, by test, to be friendly to the human eye that has close work to do over long periods of time.

This approach of the engineers is the counterpart to the most creative effort in the architecture of our day. Full understanding of "brightness control" can help an architect to clarify his aims and calculate his effects in achieving that cheerful luminosity which is the finest characteristic of contemporary interior design.

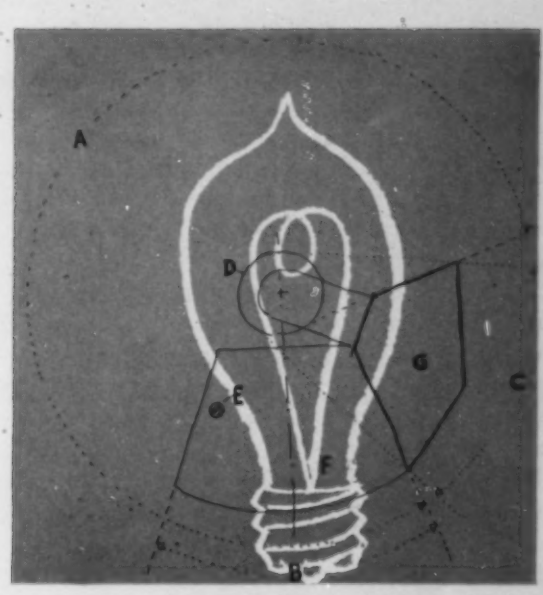
The engineers themselves have not always been the best exponents of the new approach, because they persist in talking "footcandles" as before, not realizing that others are not as versed as they in making the necessary translations. The aim in this brief article is to explain the *importance and character of brightness control.* To

PILOT EXPERIMENT. Photographs show a drafting room of Metal Office Furniture Co., Grand Rapids, designed by Earl Bullock, chief engineer, with the author as consultant. The area is 1,175 sq. ft. net. Lighting is by 96 40-watt 48-in. fluorescent lamps, total wattage with auxiliaries, 4800. Fixtures are 2 lamps wide with louvers and baffles of 45° cutoff. Illumination is 4.1 watts per sq. ft., 189 lumens per ft. Ceilings have reflection factor (R.F.) of about 78 per cent, walls 76 per cent, metal furniture 26 per cent, floor average 15 per cent, window louvers about 75 per cent, louvers on lighting fixtures, 62 per cent. Relative brightnesses are as marked on photographs, except that inner longitudinal wall, not shown, is artificially lighted to a brightness of 24 to 32 F.L. The effectiveness of this device led to development of peripheral lighting using sidewalls as auxiliary reflectors

TRO IN SCHOOL

By Kenneth C. Welch, A.I.A., I.E.S.

Mr. Welch is an architect, working most often in collaboration with other architects; he is a very active member of the Illuminating Engineering Society, and also Chairman of the Planning Commission of his home city of Grand Rapids. The combination places him in an ideal position to interpret new lighting in architectural terms, with stress on use in schools



show the concept in use, a "case study" is introduced, in the form of a contemporary school room. It must be understood that this is not a finished project but an example only, that the suggested devices are still under study, and that the *basic considerations* are the same in other kinds of buildings as they are in schools. For those interested in the complete theory there is appended a selected bibliography.

If we can create as completely as possible a comfortable, healthful, work-inspiring environment in the primary grades, we shall have done our best work in educating children and their parents in the real meaning of creative design, as opposed to the senseless compromises made in copying past styles.

Why is "brightness" so important?

Architects have just been mastering the subject of light "intensity" and learning to measure in "footcandles." Why should we now turn to "brightness" and learn all over again to think in "foot lamberts"?

The answer is that *brightness is what the eye sees.* Without brightness it is impossible to see. Brightness is light made visible. Strangely enough, there are conditions under which even the strongest light cannot be seen any more than radio waves can. This occurs in outer space, that "outer darkness" through which all the light we receive on earth passes — invisibly. The eye sees no light except when looking directly at a source or a reflection. It is well known that "daylight" or "sky light" is due to the diffusive reflection of sunlight by countless particles of atmospheric dust and moisture, and that direct "sunlight," too, is seen only when reflected from an object or a surface. Light "flux" we do not see. Our measurements had better all be made comformable to what we *can* see.

Translations into brightness terms are simple

Although the observations made above are abc to the illuminating engineer, yet in view of the complexity of the whole subject of seeing, we could avoid endless, unnecessary, confusion by deciding to state our aims and check our results in *brightness measurements exclusively.* The architect should be the first to demand this, being concerned not with quantities as such but with qualities, not with output of light or sound or heat but with its sensible effect. The translation is easy and has been clearly described by C. L. Crouch, technical secretary of the IES:

"The brightness of an object to be seen depends, first, upon how much light falls upon the object, and second, upon what percentage of that light is reflected to the eye. *The brightness in 'foot lamberts' of any diffusing surface or object is equal to the illumination incident to it (in footcandles) times the reflection factor of that surface or object.* Thus the brightness of white paper having a reflection factor of 80 per cent will be four times that of cast iron having a reflection factor of 20 per cent, under the same illumination. Since the eye sees only the brightness and not the illumination, it would be proper for the engineer and physicist to think primarily in terms of brightness (either foot lamberts or candles per square inch) and to use footcandles only as an intermediate step in the calculation or measurement of brightness. Unfortunately the . . . simplest instruments are those which principally measure the illumination. . . ."

In short the formula is,

F.L. = F.C. × R.F., or, foot lamberts of brightness equal footcandles of illumination times the reflection factor of the given surface.

Absolute brightnesses and brightness ratios

1. *Absolute brightness of the task:* Dr. Luckiesh, in *The Science of Seeing,* recommends "10 foot candles" as a conservative amount of lighting for visibility of 8-point type excellently printed. But when the task becomes one of distinguishing black thread on dark cloth the recommended footcandles jump to 500. Expressed in

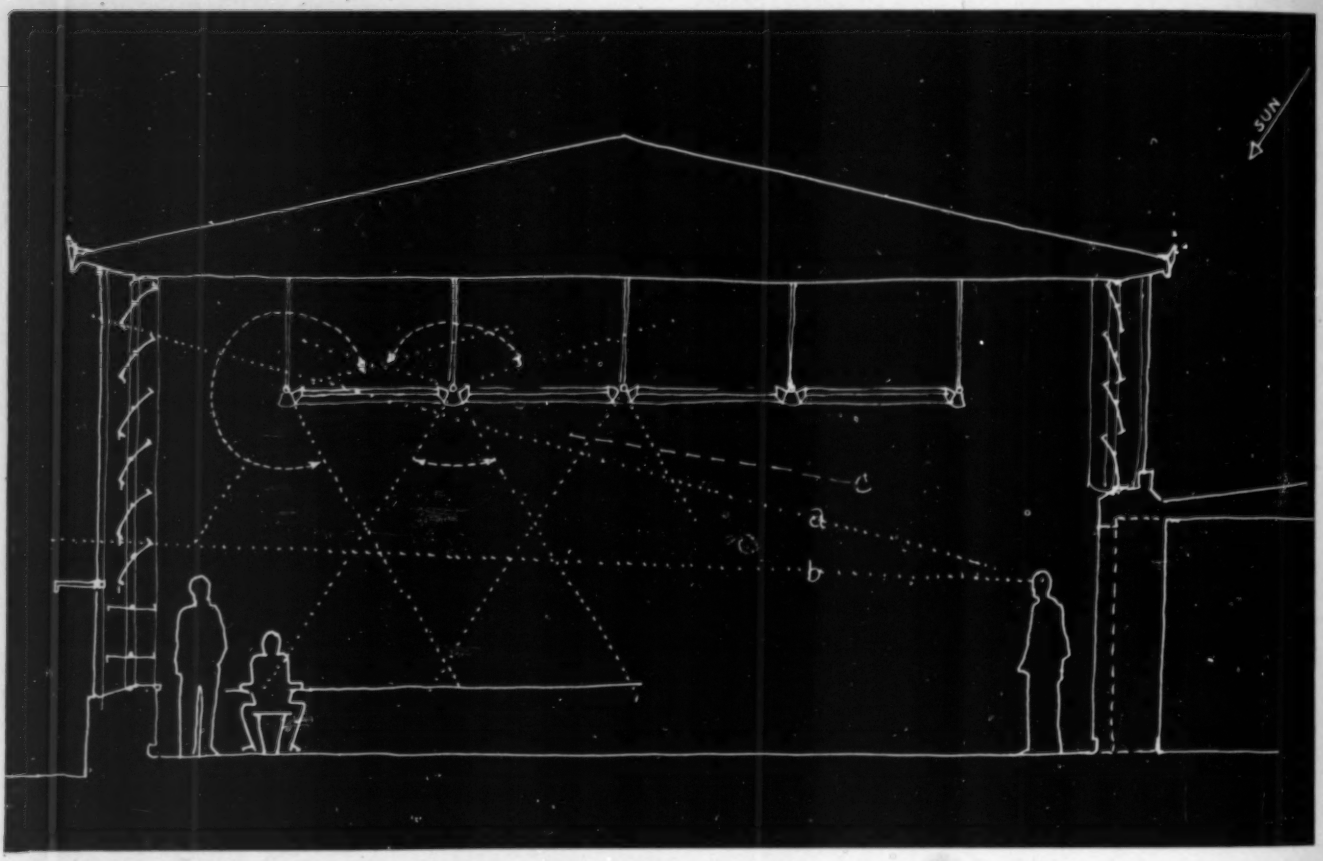
foot lamberts of brightness the requirements make much quicker sense. The paper, with a reflection factor near 80 per cent, yields *8 foot lamberts*, while the cloth, reflecting perhaps 2 per cent, yields only *10 foot lamberts* despite the enormous increase in incident illumination. The increase in brightness from 8 to 10 is a very reasonable demand in view of the lack of contrast in the elements of the latter task.

2. *Brightness ratios in surroundings:* Equally important though too often neglected are brightness contrasts within the general field of view. These are of three general types: (a) between the work and its background; (b) between the light source and its background; (c) among large areas in the visible environment as a whole. It is in this part of lighting that the worst crimes have passed unchallenged, and that Dr. Harmon of Texas found that the most amazing improvements could be made in child health through better lighting practice (AR, Feb. '46).

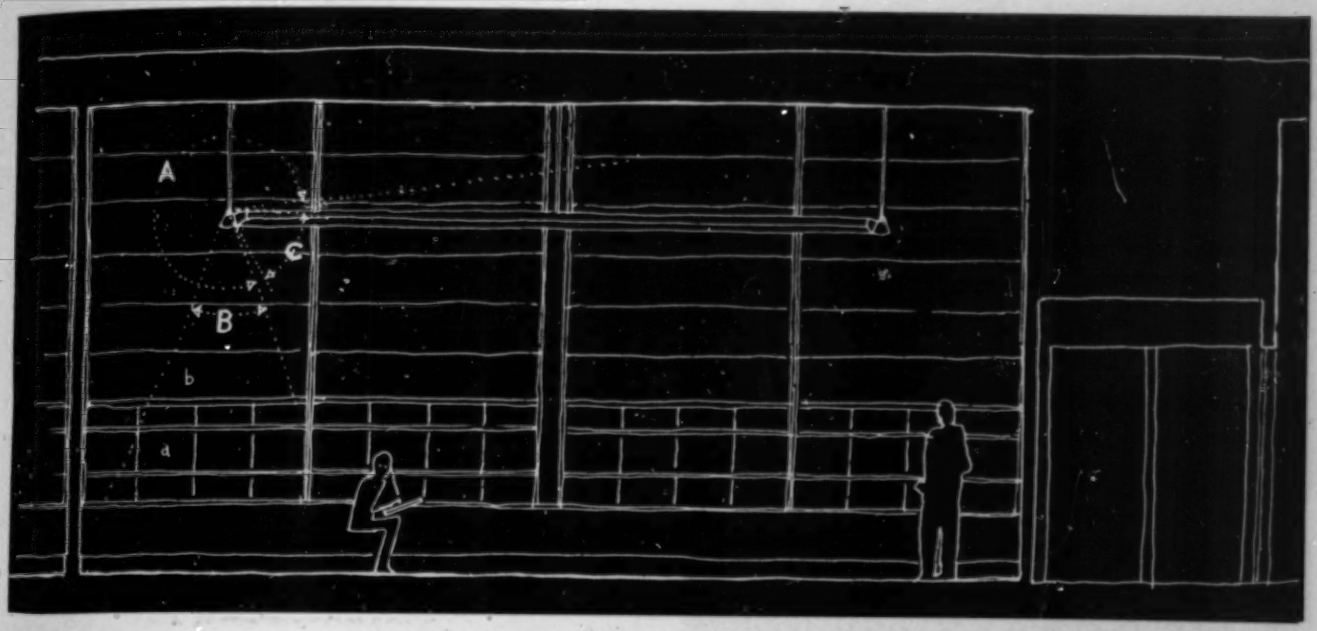
Report No. 1 of the Committee on Standards of Quality and Quantity for Interior Illumination of the I.E.S., written by some of the best minds in lighting, makes two positive statements: To attain the *best* seeing conditions, (1) the ratio of the brightness of the visual task to its immediate surroundings *is unity*. (2) The brightness ratio of a light source or of a luminous portion of a luminaire to its background *is unity*. Realizing that these ratios are virtually unachievable in work-a-day surroundings the committee adds, "brightness ratios to attain *good* seeing conditions should be not greater than 3." (Often engineers have been happy with 100!)

Our aim, then, is: nowhere a brightness ratio, between the work and its surroundings, or between a light source and its background, or among large interior areas, of more than 3.

Finally, a word about our old bugaboo, "glare." Many people still think that glare means "too much lighting." On the contrary, it has been hitherto virtually impossible to admit too much light into our interiors. The author has read comfortably out-of-doors on certain late summer afternoons when the brightness of an overcast sky varied between 500 and 1000 foot lamberts. By comparison, indoors a general level as high as 50 to 100 F.L. is remarkable. No, glare is not an excess of lighting or over-all brightness; it is merely an intolerable degree of *local brightness contrast*. Brightness ratios must be kept down, brightness averages up.



SELECTED BIBLIOGRAPHY. The Science of Seeing, by Dr. Matthew Luckiesh. Report No. 1 of Committee of Standards and Quality for Interior Illumination of the Illuminating Engineering Society, Illuminating Engineering, Dec. '44. Other articles in Illuminating Engineering: Feb. '44, Brightness Engineering, by Matthew Luckiesh; Feb. '45, Confusion in Brightness Thinking, Richard G. Slauer; Feb. '45, Luckiesh and Taylor, Radiant Energy from Fluorescent Lamps; Sept. '45, three Texas engineers, Control of Natural Light in Classrooms; Nov. '45, C. L. Crouch, The Relation between Illumination and Vision. In Architectural Record, May '44, Douglas Haskell, 16 Ways of Daylighting Classrooms; Feb. '46, Darell B. Harmon, Light on Growing Children, the story of a test on Texas school children



DESCRIPTION OF ROOM

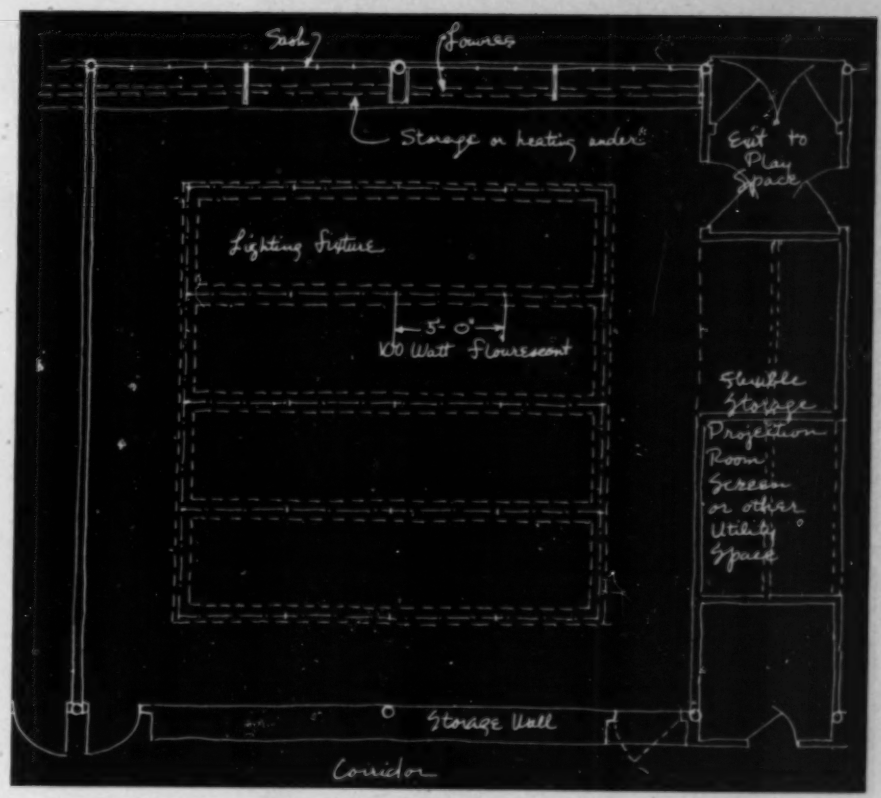
The design characteristics are:

(1) Controls are integrated for daylighting and artificial illumination.

(2) Louvers are designed (a) to admit and direct all possible sunlight or daylight under varying conditions, (b) to exclude all sky glare, (c) to create a planned brightness area in themselves day and night, (d) to produce blackout when desired. (Details, page 121.)

(3) Artificial lighting makes radical departure of utilizing sidewalls as well as ceiling for indirect lighting reflection, making unnecessary the usual objectionable high ceiling brightness and also illuminating work on walls directly. Arc A is uplight and sidelight, arc B downlight, arc C shielded to conceal source. (Fixture details and data, next page.)

Room dimensions are taken as 28 ft. by 29 ft. (a generous size for modern education); height 14 ft. Bilateral glass area is 504 sq. ft. or 62 per cent of floor area which is 812 sq. ft.

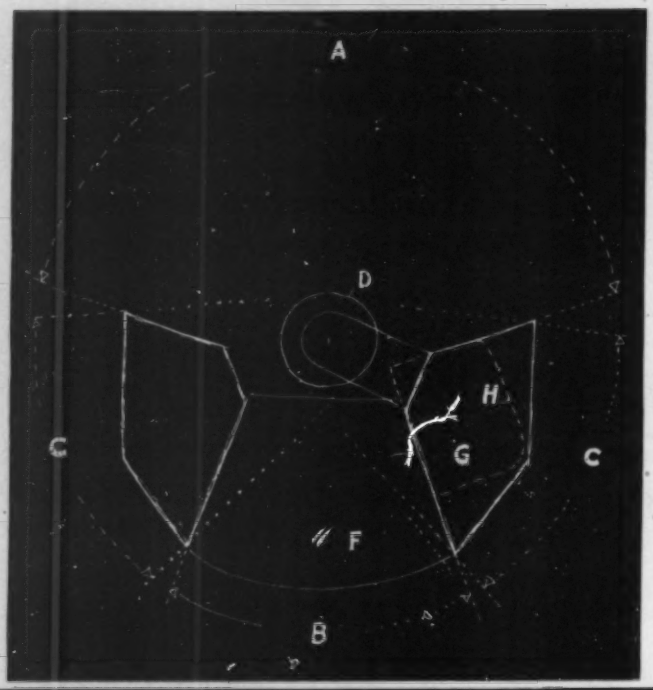


Peripheral lighting fixtures (see sketch above) throw light not only upward to ceiling but through arc "A" on sidewalls, thus adding some 1000 to 1100 sq. ft. of reflective surface to the 812 sq. ft. of ceiling and accordingly reducing brightness required on the ceiling. This extra sidewall illumination permits use of a paint with lower reflective factor, and preferably lower chroma, easier maintenance. Arc "B" is downlight, arc "C" the shielded area concealing the source from all normal viewpoints.

Fixture pattern is seen in plan, above. As drawn, it uses 28 100-watt F lamps, with auxiliaries, the output becomes 117,600 lumens.

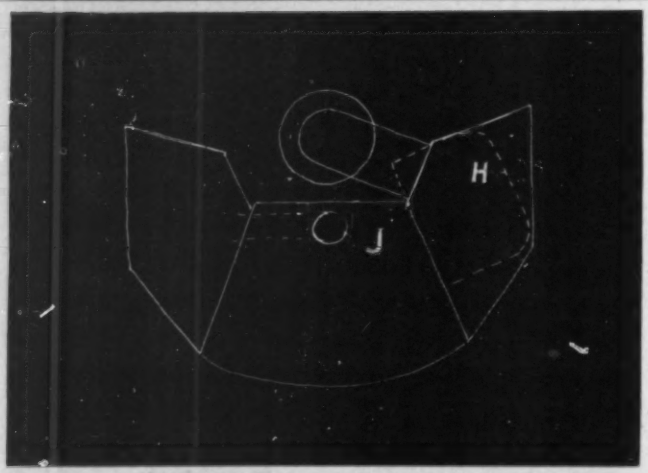
Brightness ratios: Ceiling, 40 to 50 F.L., based on white paint having 80 per cent reflection factor 70 per cent maintained. Side walls, having green chalk boards of 40 per cent R.F., and a planned average of 55 to 70 per cent R.F. in the decoration, would range in brightness from a low of 15 F.L. on the green boards to a high of possibly 40 F.L. on louvers when artificially illuminated. Desk tasks would reach a 20- to 40- F.L. brightness, based on 50 per cent R.F. (drawings) to 75 per cent (reading, writing) — desk top itself should reflect 40 to 50 per cent. We have therefore established rather ideally low brightness ratios of about 2.7 exclusive of ceiling, and of only about 3 including this area.

By comparison, brightness ratios in many "modern" schools run up to 500.



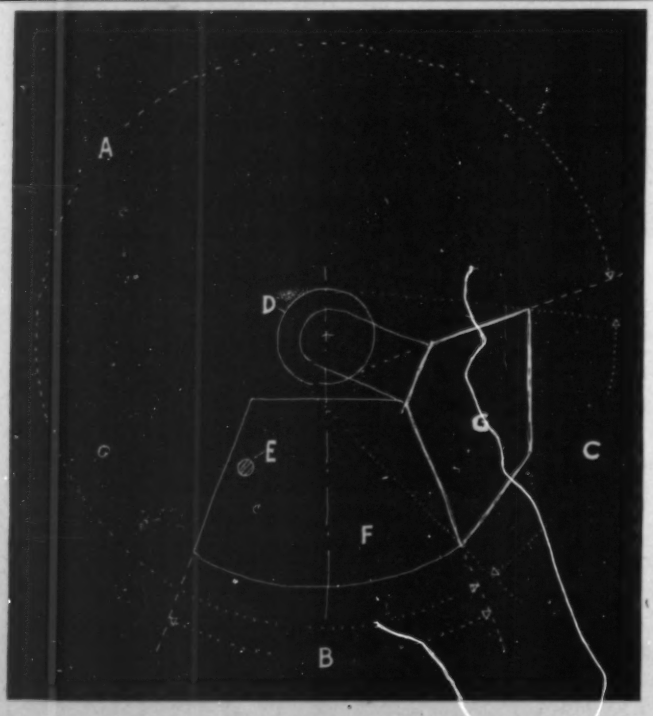
ARTIFICIAL ILLUMINATION METHODS

Sections on this page represent (1), a central fixture; (2) use of additional cold cathode during projection; (3) peripheral fixture. In (1), A is up-lighting for indirect light (42 per cent of full circle). B, louvered down-lighting, 18 per cent. C, complete shielding of source from all normal viewpoints. D, 100-watt, 5-ft. fluorescent lamp. F, louvers, 4¼-in. o.c. — reduced in reflection factor so brightness same as ceiling. G, wireway. H, two-lamp auxiliary (19½ in. long). In (3), A is up and sidewall lighting plus downlighting, over 80 per cent of full-circle. B is louvered to provide lateral shielding at 45° cut-off angle. In (2), J could be 18-mm. cold cathode of proper color, for use during projection to provide low-level light for taking notes



STATISTICS OF LAMP OUTPUT

Type of lamp	Power	Lumens per watt	Lumens per foot
COLD CATHODE	200 MA	30.5 L/W	497 L/ft
25-mm			
Yellow-white	120 MA	34 L/W	332 L/ft
	60 MA	36.5 L/W	184 L/ft
SLIM LINE	200 MA	56 L/W	400 L/ft
3500° White			
	100 MA	60 L/W	257 L/ft
HOT CATHODE	100 W	42 L/W	840 L/ft
3500° White			
	40 W	52.5 L/W	525 L/ft
INCANDESCENT	100 W	16 L/W	—
	200 W	18.5 L/W	—
	500 W	20 L/W	—



ECONOMICS OF FIXTURE PATTERN

There are many possible combinations to provide the required illumination. The scheme illustrated requires 140 ft. of fixtures, using 100-watt, 5-foot F type fluorescent lamps. The 28 lamps, including the high-power-factor auxiliaries, produce a total of 3360 watts, or a little over 4 watts per square foot, or 144 lumens per square foot. This should produce a maintained 50 footcandles.

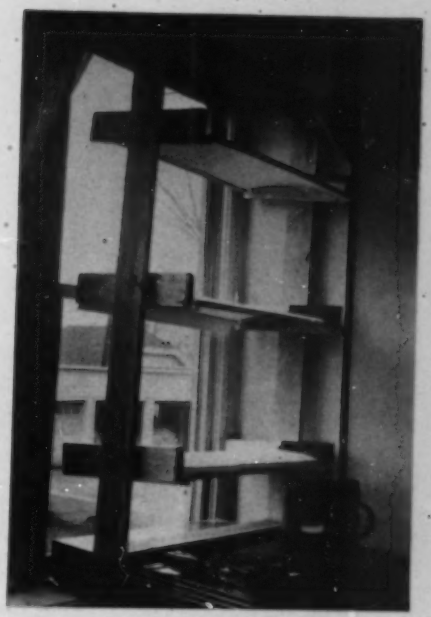
Other choices might be made, balancing cost of energy, fixture cost, lamp replacement and maintenance costs. For example, the 100-watt F lamp has a lesser lumen-per-watt output than the 40-watt F lamp but a higher lumen output per foot. This would provide relatively lower fixture costs per foot but presuppose a lower rate for electrical energy

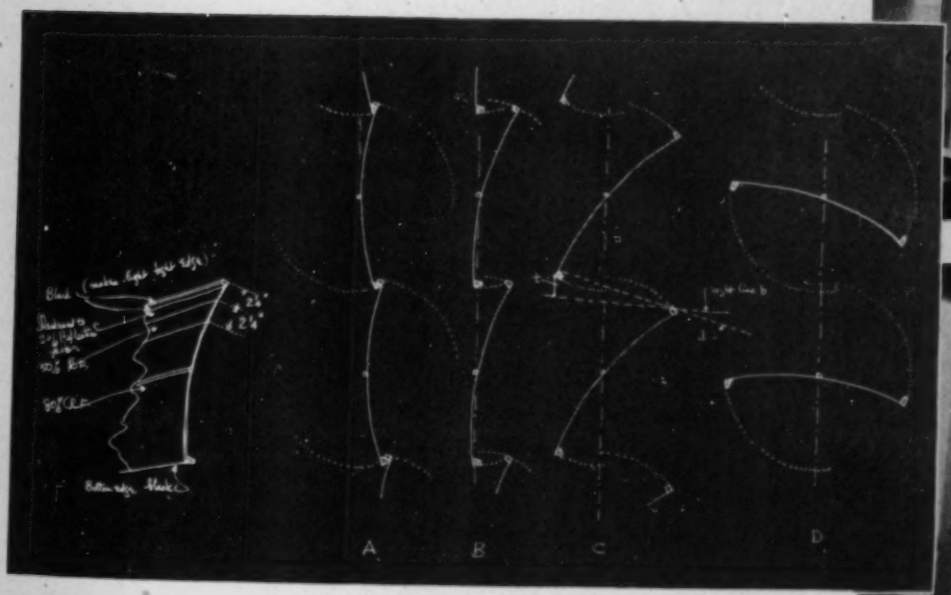
LOUVER DESIGN AND OPERATION

In photographs at right may be seen a model of the proposed louvers, and sketch shows them in section in various standard positions. After further study, now going forward, louvers will probably be made of light metal, in a width of 16 in. (to conform to modular window systems), and will be subtly graded as to color and reflection factor in the interest of maintaining low brightness ratios across the whole louvered area when light is reflected from one blade to the next above.

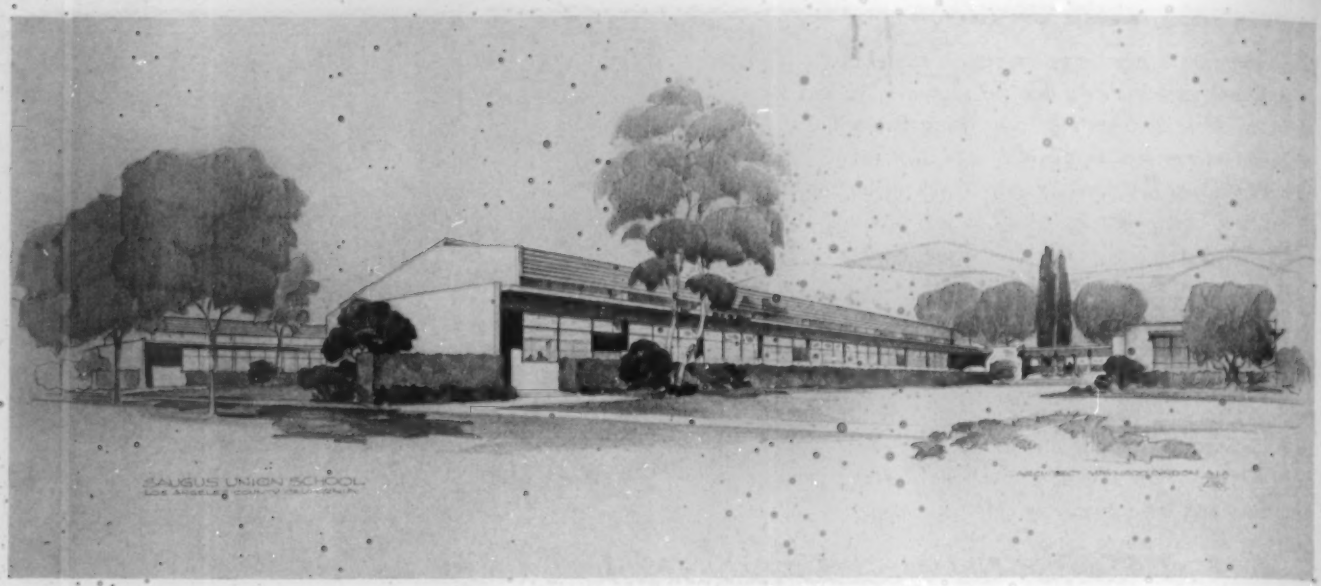
Only four positions are needed, adjusted according to latitude, orientation and locale. See sketch below. (A) Closed, louvers can serve for blackout and perform with optimum efficiency in reflecting artificial light evenings. (B) Opened to a prefixed adjustment somewhere between 7½° and 12° from vertical, to receive direct sunlight. Reflected sunlight will keep louvered area evenly bright. (C) Opened to about 40° from vertical to utilize reflected skylight. Notice how in this position sight-lines a and b determine the necessity of flaps on some louvers cutting out sky glare. (D) Opened to full horizontal position on dullest days, obstruction is about 16½ per cent of total glass area. This is still over 50 per cent of floor area, well above code requirements. Notice that there is a clear vision and ventilation strip below, hooded except in case of north orientation. Also, that louver positions are few and pre-set and lend themselves to easy control, perhaps from a single station for each side of a classroom wing. Clear strip might be curtained.

This kind of louvered control is a far cry from older, narrow types, and the author finds excellent authority for believing it more effective than prismed glass. Further study is to follow



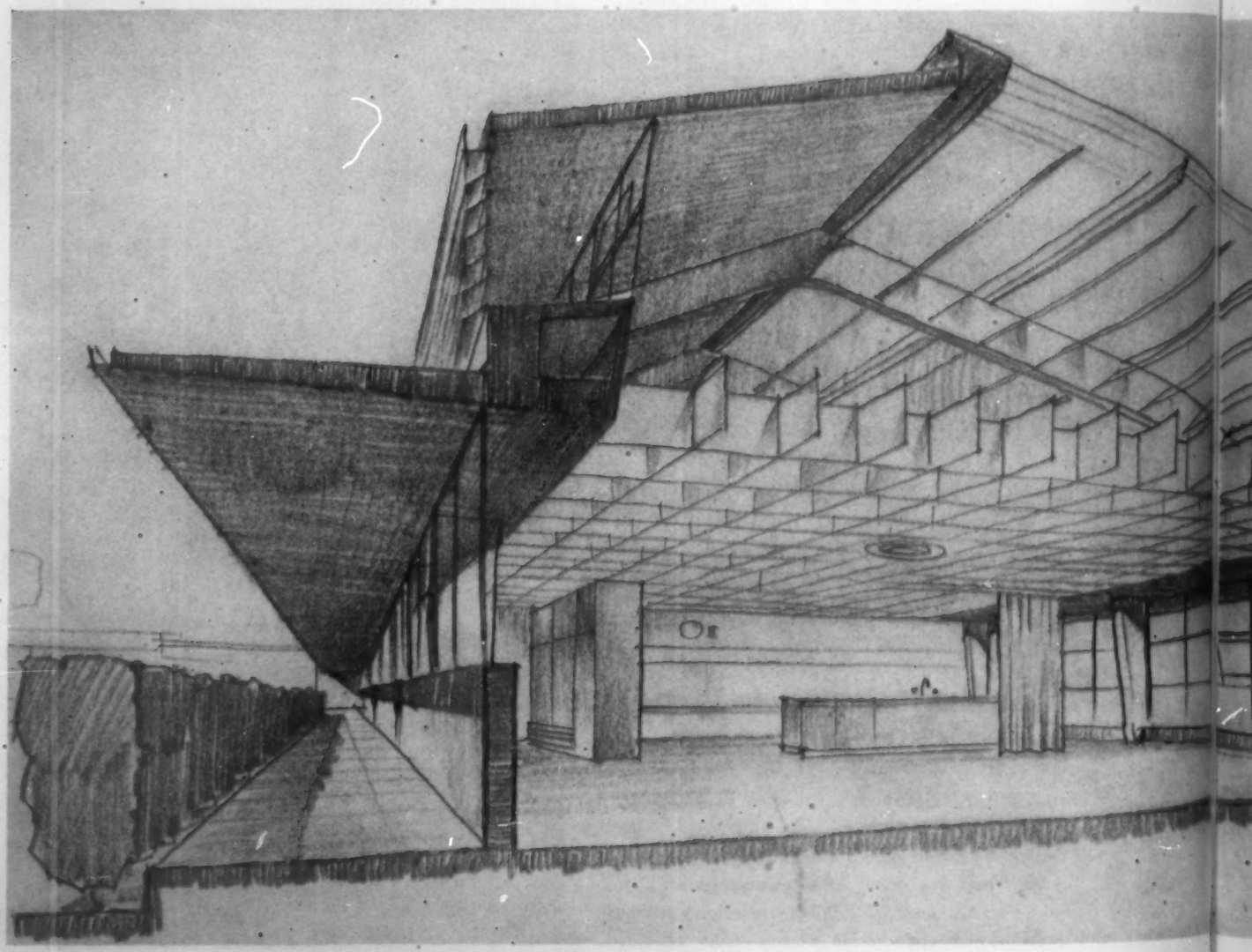


Sight-lines "a" and "b," seen somewhat faintly in the diagram above, correspond to the sight-lines marked the same way on page 116, in the diagram of the room as a whole. It may be seen why a tab or flap (t) is needed to eliminate skyglare entirely when this louver is part-way open. At left are suggestions for graded reflectivity of the louver, to distribute reflections evenly; also, lower reflectivity of upper edge permits wider opening



A RADICAL DEPARTURE IN DAYLIGHTING

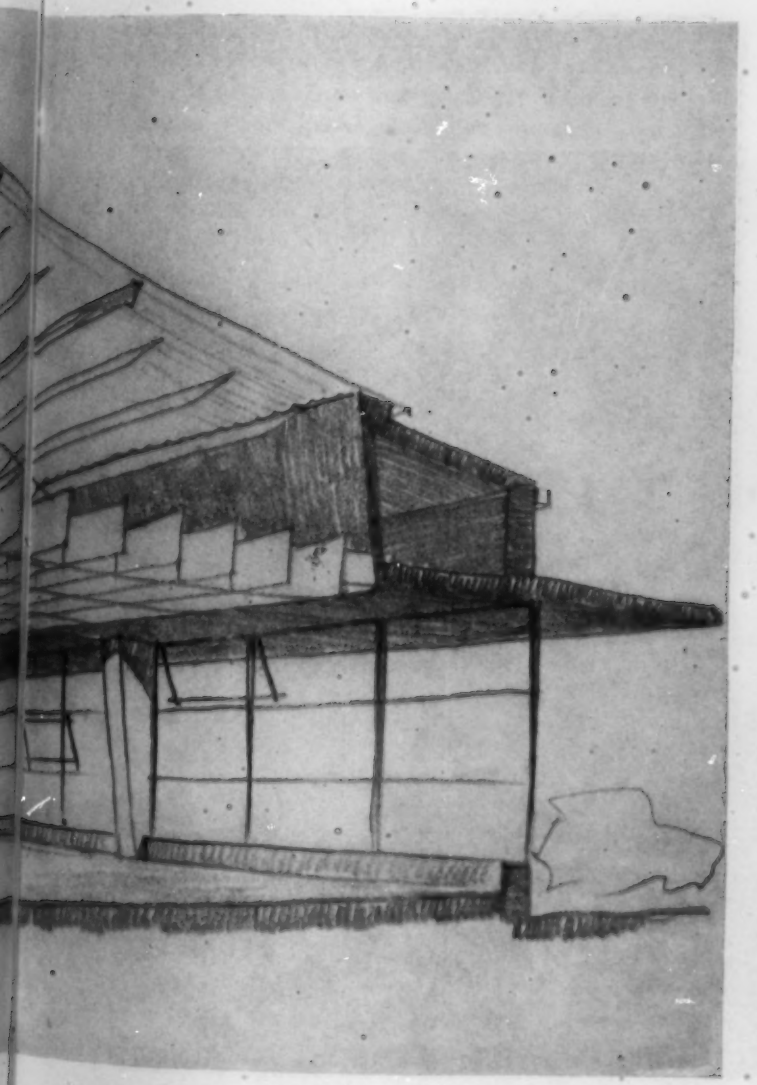
Saugus Union School, Cal., Maynard Lyndon, A.I.A., Architect



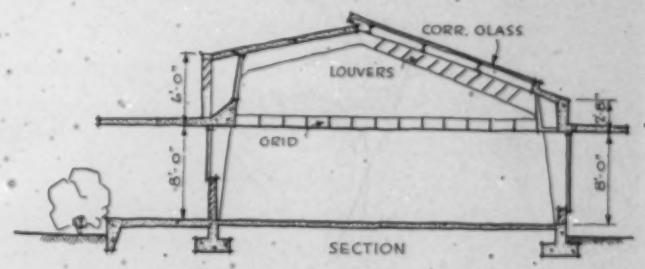
THIS is a highly interesting project by an architect who had made a marked impress on school buildings in Michigan before transferring his operations to California. As is clearly seen in the cut-away perspective, there is bold reliance on an overhead skylight to make possible a classroom of full 30-ft. width, with a perfect flood of natural illumination. The big egg-crate baffle reduces the apparent ceiling height to a child-scaled 8 ft., leaves plenty of duct space above for ventilation and heating (forced air, gas heater) or cooling by anemostat (seen in perspective view). The skylight itself is louvered to screen out direct sunlight. Radiant heat from the sun will be gathered by these louvers and held in the high area, where heat-convected air is vented out under the ridge and through the clerestory louvers. There is no skylight to be seen from within the room but the view is altogether unobstructed.

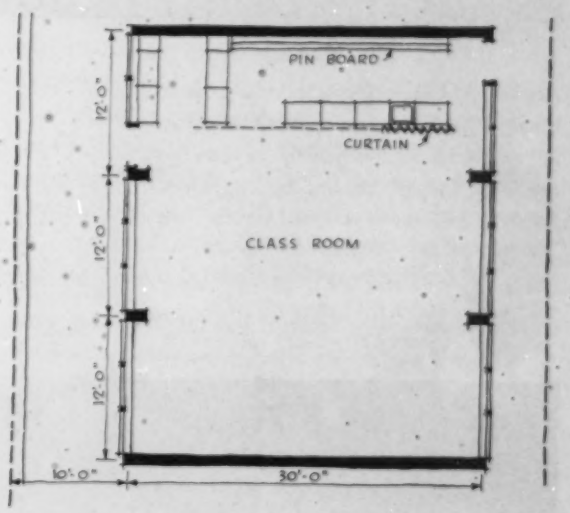
Tests on models correctly finished showed remarkable evenness of illumination, and the room seems to promise well for even brightness also.

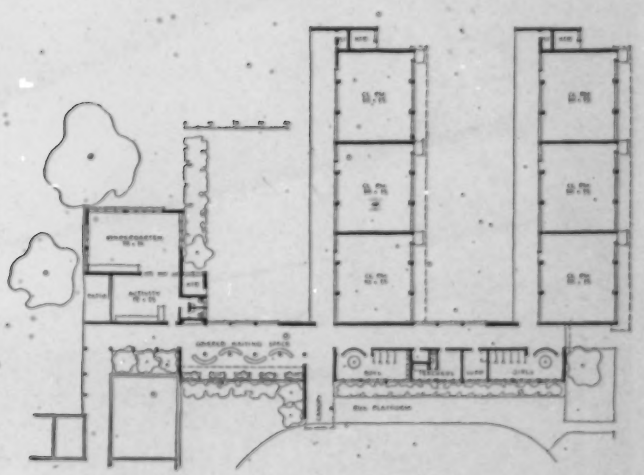
The architect declares that during the school year in California there is actually more of a heating problem than a cooling problem, so any sun gain is likely to do more good than harm in maintaining suitable conditions.



Section, below, shows arrangement of baffles and of the egg-crate which brings the apparent ceiling down to 8 ft. while preserving the full air volume of a larger room. In the egg-crate, members running lengthwise of the room are opaque, those running transversely are translucent. This scheme was devised early in 1945, and further work is being done on it at present





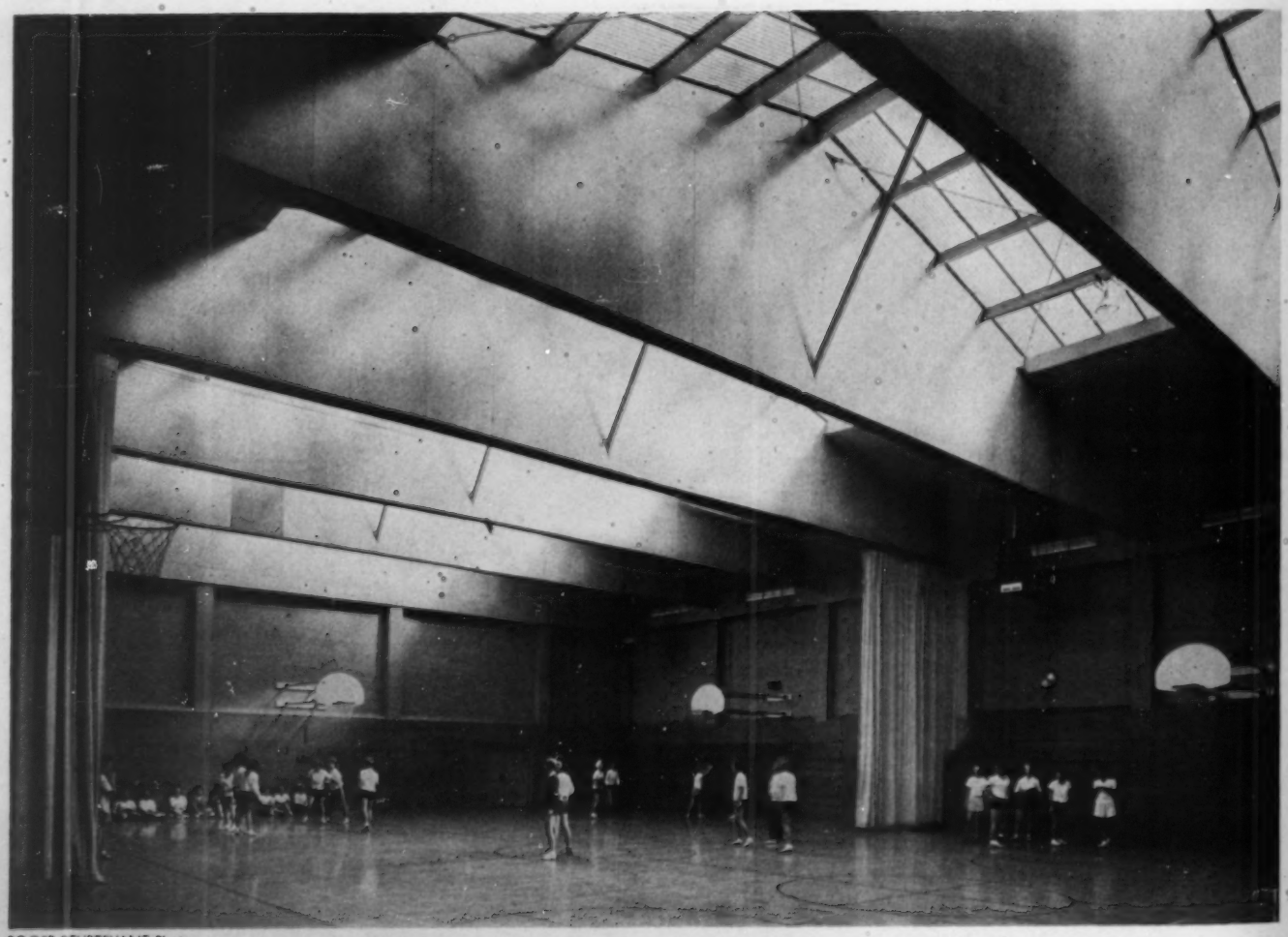


In general plan, the proposed Saugus Union School follows the typical California pattern with square classrooms (the latest shape) conjoined to outdoor classrooms and set in parallel rows. Part-plan shown herewith does not indicate the further school development, including cafeteria and other community provisions, to be treated more fully upon their completion

Above and below: Gymnasium of Lakeside Union School, California, Frank Wynkoop, A.I.A., Architect. A type of school room requiring special heating by unit electric heaters, as seen in the interior view

A REPORT FROM CANADA ON HE

From "Interim Report on Elementary Schools" by a Committee of Architects in Ontario



ROGER STURTEVANT Photo

INDOOR air that is free of pollution and is kept at an optimum temperature is of primary importance for health and for efficiency. Economic considerations, however, limit the use of such heating and air conditioning systems, which would at all times, and automatically, ensure the maximum of comfort and efficiency. The need of compromise which was thus forced onto the highly mechanized automatic heating and air conditioning installations, in order to render their operation and maintenance economical, has defeated, to a great extent, their technical advantages, and, for some time now, the trend has been back to the simple and well-established heating methods.

Hot Air Heating

Heating with hot air, which has many adherents, should be restricted to small, one or two room schools. In order to supply, without discomfort to the occupants, all the heat needed for comfort in the building, large quantities of air must be circulated. They exceed considerably the minimum quantities of fresh air considered necessary for the well-being of the pupils. In order to supply the heat economically, it then becomes inevitable to recirculate air from the classrooms. This is objectionable, as it renders impossible the separation of classrooms and tends to spread infection and to create lesser evils such as spreading of odors, dust, etc. These considerations apply equally to directly heated (small) and indirectly heated (large) plants. Another drawback is that recirculation from the coldest points of rooms (under windows) is not always possible — particularly with floors on ground — and the coolest air in the room is forced to travel often right across the floor, to recirculating openings, causing marked drafts.

Heating with unit heaters has been used, to some extent, but — if these operate intermittently — is not satisfactory, due to changes in air currents and air temperatures; even continuous, variable temperature operation has the drawback of highly concentrating heat supply, and considerable air currents along floors to return ducts.

The same reasoning applies, to a great extent, to unit ventilators, unless they operate entirely without air return. In addition, fully satisfactory control of heat supply is difficult and expensive.

Hot Water Heating and Steam Heating

In general, until further research has broadened the field, it can be considered safe practice in schools of more than two classrooms to employ direct radiation (or convectors) using hot water as heating medium, provided that simultaneously sufficient fresh air is brought into the classrooms to ensure comfort and good health.

The reasons for the preference for hot water heating over steam heating systems are the following:

a. Hot water ensures continuous heat supply at varying temperatures; this is closely approached by sub-atmospheric steam heating, though the control of the hot water systems is easier and simpler.
b. If equipped with a circulating pump, it is independent of the relative location of radiators, mains and boiler (as long as care is taken to properly vent the system).
c. Hot water heating supply and return mains may be run parallel, that is, they may grade in the same direction, and often have been installed with negligible slope, whereas steam heating systems require, for satisfactory and quiet operation, opposite grading of steam and retain mains, sufficient slope and location of condensation receivers below low point of return.
d. Minor deviations from accepted requirements of installation will tend to defeat quiet operation in steam heating systems, whereas a hot water heating system is under all working conditions quiet.
e. A very important point is that usual water temperatures of hot water heating systems are, below the temperature, apt to decompose organic dust particles which create small amounts of irritant fumes, and lead to feeling of dryness: even well designed vapor systems tend to reach, at times, 200 to 215 degrees Fahrenheit, when this decomposition becomes inevitable.*

The only disadvantages of the hot water heating system — against a sub-atmospheric steam heating installation — are that it is somewhat sluggish in heating up or cooling, and, due to lower temperatures, is somewhat more susceptible to freezing, if operated carelessly.

Heating by direct radiation, if properly planned, has proven itself reasonably satisfactory, as it ensures:

a. Placing of heating surfaces where most needed, in order to counteract heat losses, namely, under windows and at outside wall.
b. Preheating of air introduced for ventilation through windows, and correcting for inadequacies of leaking window frames and sash.
c. Counteraction to the radiant cooling effect of windows, etc., on the nearby pupils.
d. Air circulation throughout the room, due to the inherent convection currents, thus giving reasonably even temperature distribution in the heated space.
e. Good central control of the heat in accordance with outdoor temperatures or other demand factors.
f. Reasonable first cost.

Disadvantages are occasionally cited:

a. The space requirements of radiators and the difficulty of keeping them clean.
b. The massed heating surfaces which may be objectionable to nearby pupils. This is, however, usually due to faulty design.
c. Noticeable and possibly objectionable convection currents and cold floors—particularly where floors are laid on grade (this latter objection does not apply to the usual classroom with heated space underneath).

*These reasons apply generally, but they assume more importance in single story buildings, particularly if it is desired to eliminate overhead piping.

Ventilation of Classrooms

The required quantity of fresh air could be introduced — with radiator heating — through windows or other openings directly from the outside; the spent air should be exhausted through suitable ducts or ventilators in or near the wall opposite the air inlets, and should be preferably forced by means of fans, to ensure positive air movement regardless of atmospheric conditions.

Supplying heated fresh air — without recirculation — through a central supply system would be an improvement over the above simpler method, particularly as it would eliminate possible drafts from open windows in cold weather. The cost of such a system would be moderate, and it would allow the maintaining of an optimum air humidity, if desired.

Systems of ventilation which employ recirculation of some of the air should be eliminated for the same reasons as hot air heating.

Panel Heating

Very satisfactory results have been obtained in many British schools and in some schools in the United States with heated floors — which is one of the many forms of the recently much discussed panel heating. In this country, no practical results are yet available with these forms of heating, and they must be considered experimental. If properly planned, they have a beneficial effect on the comfort and, through it, on the health and efficiency of the pupils. It must be borne in mind that, with floor heating:

1. Even in our climate, the floor temperature must still be kept at or below body temperature, as in milder climates. This will necessitate large heating surfaces, which may exceed the available floor area, unless some or all of the following measures are applied:
   a. Windows should be at least double glazed, and may require triple glazing in the colder sections of the country.
   b. Heat transmission through roof areas of single story buildings should be reduced by suitable insulation.
   c. Uncontrolled air ingress through window cracks, etc., should be restricted to a minimum, or better, eliminated.
2. Due to the slow temperature change of the heated floor, controls must be exacting and anticipating, which adds to their cost.
3. Due to the distribution of heat supply over the entire room, it is difficult to provide draftless ingress of air, and this may force introduction of a supply ventilation system.
4. At the present time, panel heating systems probably will be more expensive than good direct heating systems. This is due to the considerably increased amount of work which needs to be done at the site, and the need of particularly skilled mechanics to do this work.

If any of the above precautions are neglected, the heating and ventilating system will show serious shortcomings during the colder season, viz., it will either not permit the introduction of the required fresh air, or it will have to be operated at objectionable and even detrimental surface temperatures, as an increase of the heating surface beyond the available floor area is difficult.

Requirements

Although many authorities recommend classroom temperatures of 65 to 68° F., the general practice has been to design school heating systems for 70° F., which must be ensured at the recognized base temperature (outdoors) applying in the particular locality. This is usually taken at 15° F. above the lowest recorded local temperature for the ten preceding years.

In addition, sufficient heating capacity should be provided to warm the minimum amount of fresh air required for proper ventilation, through the above temperature range. (In lower cost schools, this is often neglected, and forces elimination of air supply on very cold days.) This shall be either distributed over the entire school or centralized, where central supply ventilation is provided.

For floor heating systems, the desirable room temperature may be set 3 to 5° F. lower.

The minimum quantity of fresh air supplied to the classrooms, when in use, should be 15 cu. ft. per minute per pupil. To ensure this, either the exhaust ventilation system, or the supply ventilation, shall be designed for this full capacity.

Wardrobes and clothes cupboards should be provided with exhaust ventilation from the top and, of course, with an air inlet at the bottom. If general exhaust is mechanically forced, wardrobe exhaust must also be mechanical.

Washrooms shall be provided with exhaust ventilation which must be mechanical, if other parts of the building have mechanical exhaust ventilation, in order to prevent back-flow.

Auditoria, gymnasia, laboratories, domestic science rooms, etc., shall be ventilated by means of exhaust ventilating systems designed to dispose thoroughly of any pollution originating therein. Supply ventilation may have to be added for some cases.

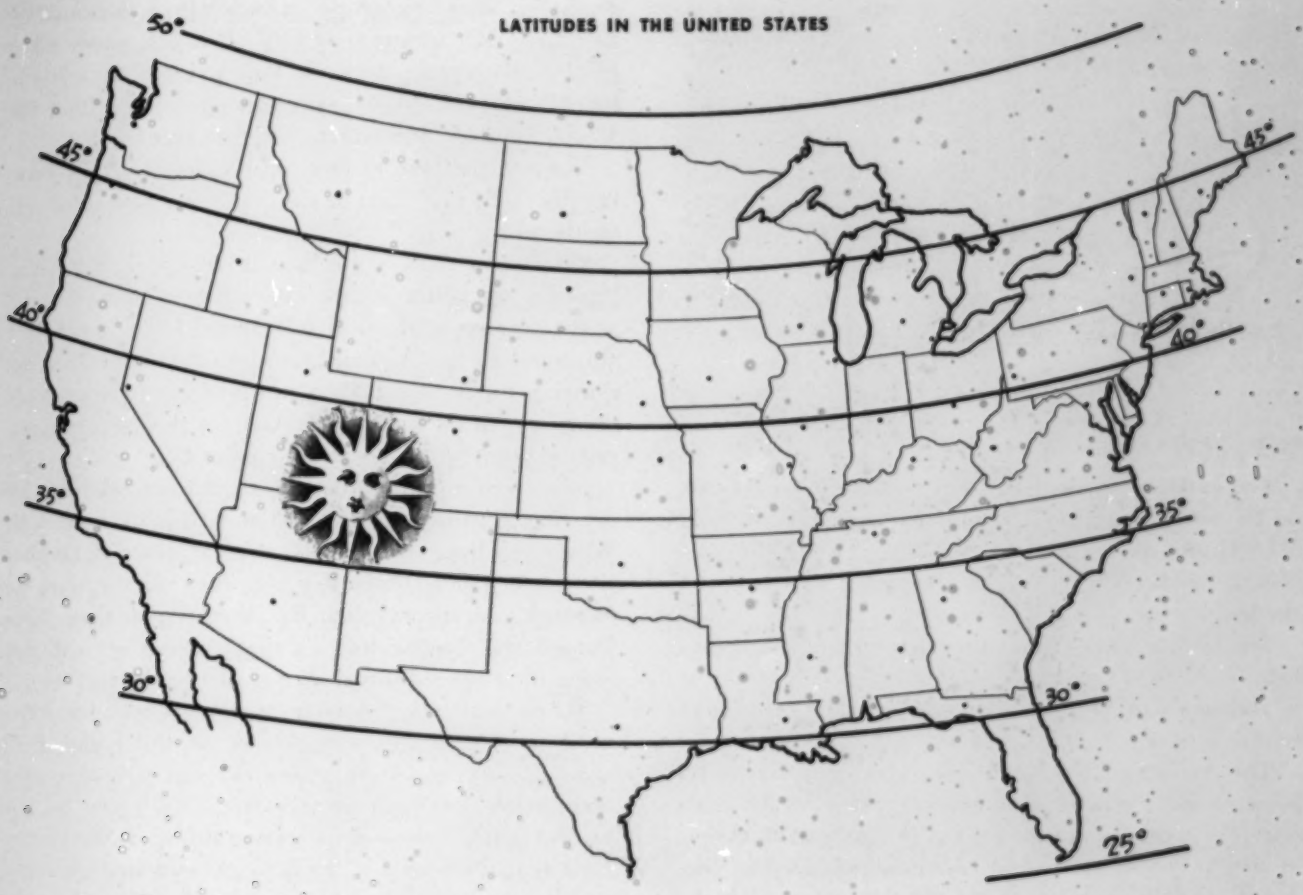
The designer shall be responsible for low surface temperatures of heating surfaces, quietness of operation of mechanical equipment, reduction of air currents to limits conducive to health and comfort, etc.

Heating systems in small schools may be centrally controlled, either manually or automatically. In larger installations, zoning according to exposure is justified. Individual automatic room temperature control is a refinement which has lost some of its earlier importance, due to recent improvements in zone or central controls, and elimination of steam heating systems with constant steam pressure.

Some of the aspects of heating and ventilation, such as maintaining a given air humidity, cleaning or air supply to classrooms and other related subjects have not been dealt with in this report.*

---

*Reprinted by permission of *Journal, Royal Architectural Institute of Canada.*



SHORT CUTS TO SOLAR ANGLES

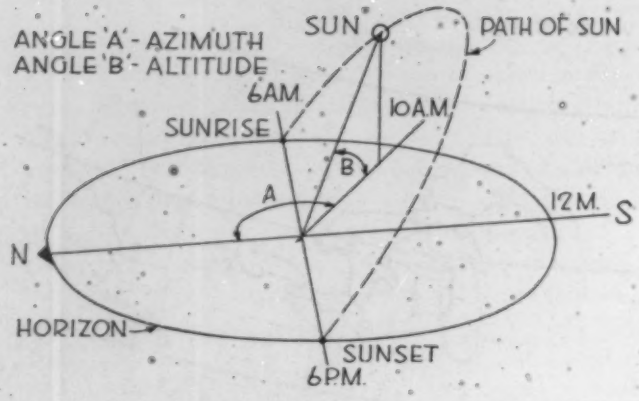
By Hendrik P. Maas

With the increasing use of larger glass areas and more emphasis generally on solar orientation, it is increasingly important for an architect to have in his files information on the sun's position as it varies from season to season and from hour to hour. Only with that information can he solve problems of sunlight and shade.

The purpose of this presentation is to simplify the architect's calculations. While the determination of the sun's position at any given time has involved the author in some fairly complicated exercises in navigational mathematics, the data here given should leave little for the reader to do, except, of course, to apply the data to his own design. This involves only some graphic projection of a routine nature. For the designer who demands hairline accuracy the necessary formulas are appended. But a navigator's accuracy could hardly ever be required for a building problem; the charts and tables on succeeding pages should eliminate the mathematics for all normal purposes of architects.

The scope of the data is for selected hours between sunrise and sunset, at each fifth parallel of latitude from 70° North to 70° South, for the critical dates of December 22, March 21, September 23, and June 22. These dates give, of course, the extreme and the mean conditions for sun angles. For the latitudes of the United States (see map) diagrams illustrating the sun's angles are given with the tables (see Time-Saver Standards, pages 131 and 133). The diagrams are really horizontal projections of the sun's paths, as illustrated a bit more graphically in the sketch at the top of page 126. For other latitudes the data is given only in tables, page 133.

The diagrams and tables may be used directly for the latitudes given; for intermediate latitudes the answer is readily obtained by interpolation between the figures given, for the desired hour, for the nearest latitudes above and below.



Solar Angles Made Easy

The position of the sun with respect to any point on the earth's surface is defined by the angle of AZIMUTH and the angle of ALTITUDE. These angles, of course, are determined by the latitude, the date, and the hour.

The AZIMUTH is simply the angle measured horizontally from the North meridian. For morning hours it is measured in an Easterly direction; for afternoon hours, Westerly.

The ALTITUDE is the angle, measured vertically, between the sun and the horizontal plane of the horizon. These angles are illustrated in the sketch above. It should be noted that the North meridian is the true North, not the magnetic North. The diagrams with the actual data, pages 128 and 131, represent the path of the sun for the given date and the given latitude, as shown in plan. The eliptical curve represents the horizontal projection of the path of the sun. The heavier lines are the horizontal projections of the angles of altitude for each line of azimuth shown. The angles of azimuth and altitude for various hours are tabulated below the diagrams. The earliest and latest hours are those of sunrise and sunset, to the nearest ten minutes.

The diagrams and tables may be applied to southern latitudes simply by transposing the summer and winter dates and the fall and spring dates.

How to Use the Tables

To illustrate the procedure for using the tables we will determine, graphically, the condition of sunlight on a simple one-room structure with a roof overhang, choosing, just for instance, the hour of 11 A.M. on June 22, and the latitude of 42° (New York City). We shall locate the line of the shadow cast by the roof overhang.

The photograph of the cardboard model shows roughly how the structure would appear, and how the shadow would fall.

For the calculation, the plan of the structure is drawn in the normal manner. Next the North line is drawn on the sheet, just as in any plot plan. This North lines gives us the starting point for the graphic solution of the problem.

Now we refer to the diagrams and tables (page 131), to find azimuth and altitude angles for the given condition. Here comes the interpolation. Azimuth of 40°, 11 A.M., summer, is 138°. For 45°, same time, 145°30′. By simple interpolation, we get an azimuth for 42° of 141°. In the same manner the altitude for 42° N, 11 A.M., summer, is found to be 67°30′.

Now, on the plan at any convenient point, we draw the line A-B, 141° East of the North position indicated on the plan.

Parallel to A-B, a ray line is drawn on the plan, through the point we are interested in, the point C′ at the juncture of the wall and the roof. Now we project this point on line A-B and thus get a starting point for drawing an elevation (or as much of an elevation as is necessary) of the building on A-B. On this elevation the critical point we are locating is point C.

Next we add the altitude to the calculation, by drawing, through point C, a line at 67°30′ from A-B. Where this lines crosses A-B, point P, gives us another projection point. Projecting this back to the plan we locate P_1 on the ray line R_4. At this point we have located the shadow line on the terrace — it will run along the terrace through P_1 parallel to the roof line.

We can continue, if we like, to get other shadow lines, until we can outline the shadow of the building all around, and even learn where the sun will strike the floor inside (through the window). To carry on, we project point P_1 down to a section below, to the terrace level at P_2. Now from C_2 to P_2 we get still another angle, which is measured and found to be 80°30′. This angle, it will be seen, has been found graphically; it is the direct elevation of the angle at which the sunlight at this particular time casts shadows around our particular building.

Using this new angle, 80°30′, we can carry the projection process backwards from section to plan, and so outline the shadow of the building.

FORMULAS FOR DETERMINING AZIMUTH AND ALTITUDE

For those who may have a special need of knowing accurately the AZIMUTH and ALTITUDE for a particular date or hour not given in the tables the following formulas and information are given:

I $\sin h = \sin L \sin d + \cos L \cos d \cos t$

II $\sin Z = \sin t \cos d \sec h$

III $\cos t = -\tan L \tan d$ (when $h = 0°$)

IV $\cos Z = \sin d \sec L$ (when $h = 0°$)

V $$\cos t = \frac{\sin h - \sin L \sin d}{\cos L \cos d}$$

in which:

L = latitude

d = declination; i.e., the angle between a line connecting the centers of the sun and earth and the plane of the equator.

t = time of day expressed in degrees. Since there are 24 hours and also 360° degrees in one

revolution of the earth, 1 hour = 15°, 1 minute = 15′ and 1 second = 15″. This angle is always measured from the noon position of the sun, therefore noon = 0°, 10 A.M. = 30°, 4 P.M. = 60°, etc.

Z = AZIMUTH

h = ALTITUDE

Declination of the sun varies for each day of the year from approximately 23°27′ North to 23°27′ South. When the declination is North, it is considered plus (+), when South, minus (−). The precise declination as it varies for each year can be found in the American Nautical Almanac issued annually by the U. S. Naval Observatory, Washington, D. C., and may be purchased from the Superintendent of Documents, Washington, D. C. for 65¢. For convenience a table of declinations for each seventh day of the year, simplified to the nearest 5′ is included (below). Intermediate declinations may be interpolated with reasonable results. The reader is cautioned to remember that when the declination is South it carries a minus (−) sign in which case, in the above formulas, the sin and tan will have a negative value while the cos will have a plus value.

When h = 0°0′ it is the hour of sunrise or sunset.

Example: Find AZIMUTH and ALTITUDE of sun at 2 P.M., May 15, at Latitude 42° N.

L = 42°

d = +18°40′ (interpolated between +19°25′ and +17°40′ from Table of Declinations)

t = 30°

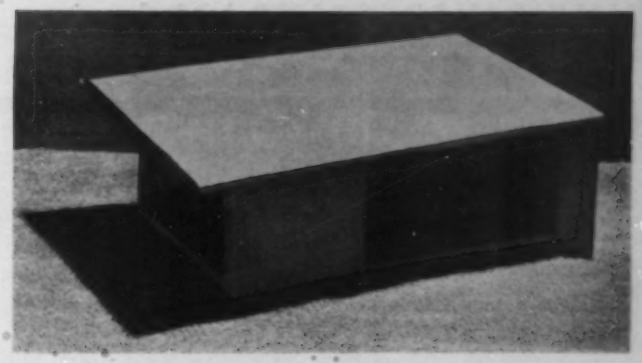
Computations by Slide Rule

From I $\sin h = \sin 42° \sin 18°40' + \cos 42° \cos 18°40' \cos 30°$

$= .670 \times .320 + .745 \times .950 \times .865$

$= .215 + .612 = .827$

$h = 56°$



From II $\sin Z = \sin 30° \cos 18°40' \sec 56°$

$= .500 \times .950 \times 1.79$

$Z = 59°$ or $121°$

Since Z is measured from the North meridian, by inspection the proper answer is 121° to the West.

The hour of sunrise (or sunset) and its AZIMUTH may be found from III and IV.

Local sun time* may be found from V

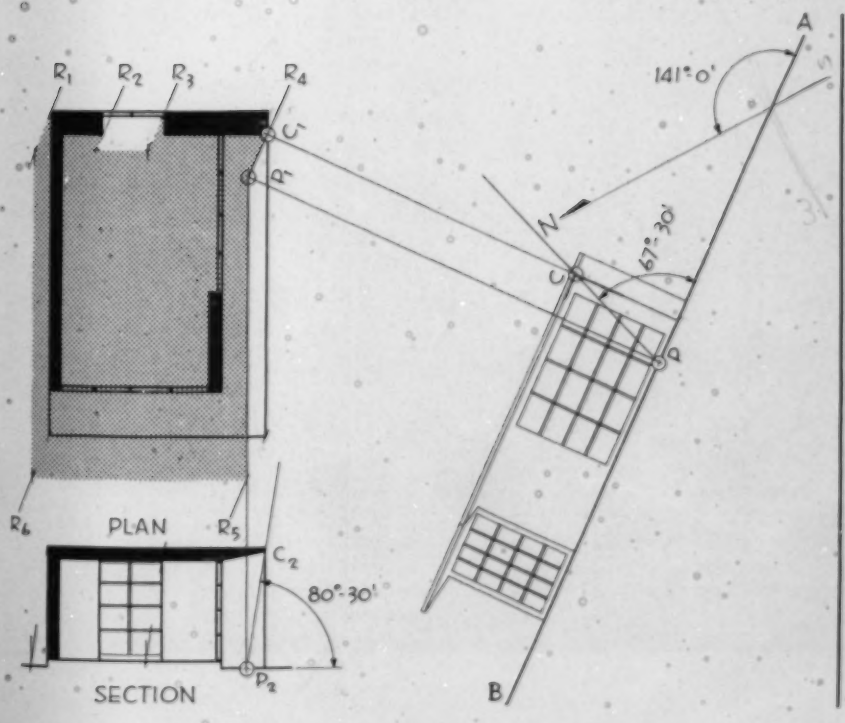
The noon ALTITUDE of the sun may be quickly found for any latitude and any declination by the following additional formulas.

a. h = 90° − (L − d) when L is greater than d

b. h = 90° − (d − L) when d is greater than L (L and d same name)

c. h = 90° − (L + d) (L and d contrary name)

* Sun time is the hour of day as determined by the position of the sun with relation to its noon meridian. Since standard time (clock time) is based on the sun time at the center of each hourly time zone, sun time may vary as much as ½ hour from standard time depending on the locality.



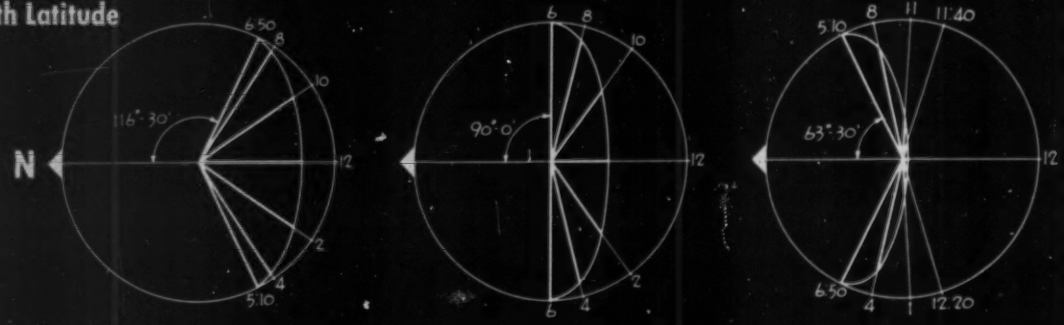
DECLINATION OF THE SUN — NEAREST TO 5′

DATE	DECLINATION	DATE
June 22	+ 23°-30′	
15	+ 23°-15′	June 29
8	+ 22°-45′	July 6
1	+ 21°-55′	13
May 25	+ 20°-50′	20
18	+ 19°-25′	27
11	+ 17°-40′	Aug. 3
4	+ 15°-45′	10
Apr. 26	+ 13°-20′	18
19	+ 11°- 0′	25
12	+ 8°-30′	Sept. 1
5	+ 5°-55′	8
Mar. 28	+ 2°-50′	16
21	0°- 0′	23
14	− 2°-50′	Oct. 1
7	− 5°-35′	8
Feb. 28	− 8°-15′	15
21	− 10°-50′	22
14	− 13°-15′	29
7	− 15°-30′	Nov. 5
Jan. 31	− 17°-30′	12
24	− 19°-20′	19
17	− 20°-50′	26
10	− 22°- 0′	Dec. 3
3	− 22°-50′	10
Dec. 27	− 23°-20′	17
	− 23°-30′	22

DIAGRAMS OF AZIMUTH AND ALTITUDE OF THE SUN

WINTER Dec. 22 FALL Sept. 23 March 21 SPRING June 22 SUMMER

25° North Latitude

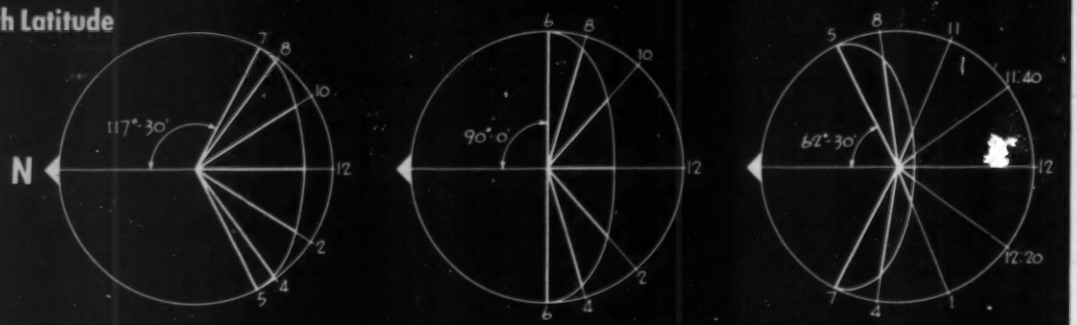


A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°-0'	41°-30'
10:00	2:00	146°-30'	33°-30'
8:00	4:00	125°-0'	14°-30'
6:50	5:10	116°-30'	0°-0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°-0'	65°-0'
10:00	2:00	126°-0'	51°-30'
8:00	4:00	103°-30'	27°-0'
6:00	6:00	90°-0'	0°-0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°-0'	88°-30'
11:40	12:20	107°-0'	85°-0'
11:00	1:00	93°-0'	76°-0'
8:00	4:00	78°-0'	35°-30'
5:10	6:50	63°-30'	0°-0'

30° North Latitude

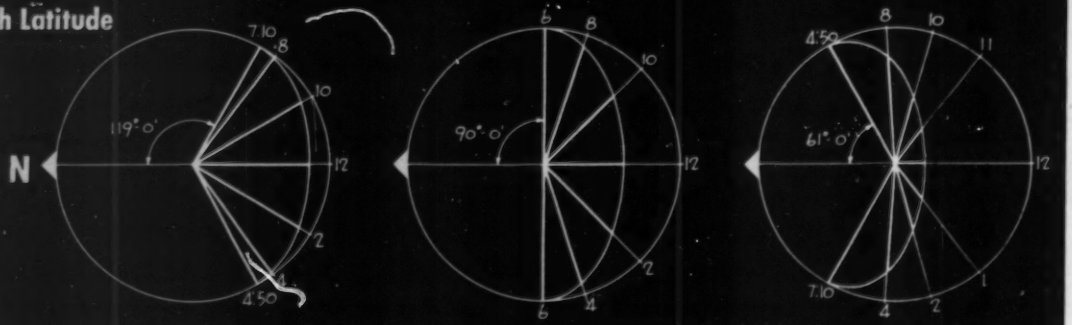


A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°-0'	36°-30'
10:00	2:00	148°-30'	29°-0'
8:00	4:00	126°-0'	11°-30'
7:00	5:00	117°-30'	0°-0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°-0'	60°-0'
10:00	2:00	131°-0'	48°-30'
8:00	4:00	106°-0'	25°-30'
6:00	6:00	90°-0'	0°-0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°-0'	83°-30'
11:40	12:20	144°-30'	82°-0'
11:00	1:00	112°-30'	75°-0'
8:00	4:00	81°-30'	36°-30'
5:00	7:00	62°-30'	0°-0'

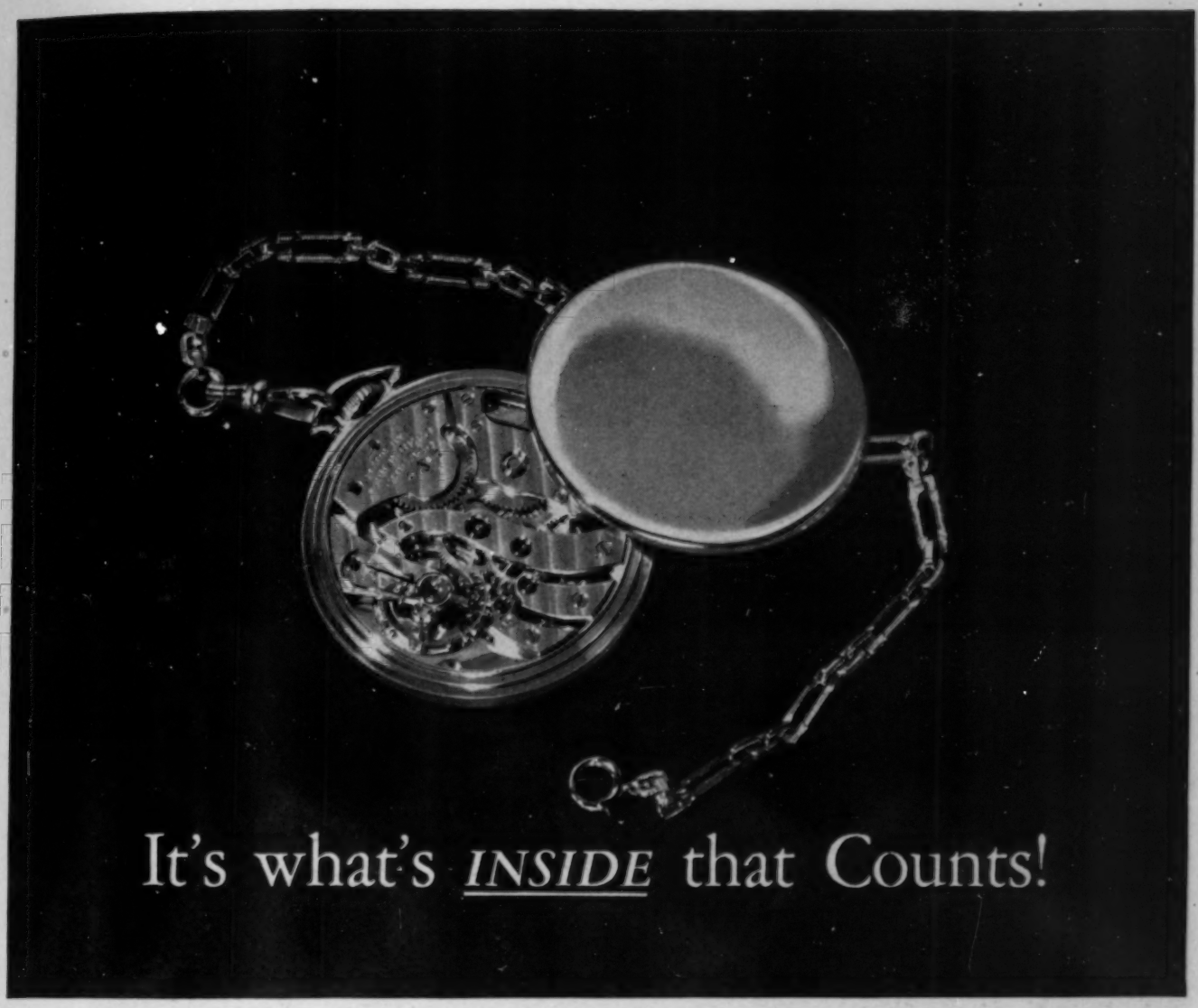
35° North Latitude



A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°-0'	31°-30'
10:00	2:00	149°-30'	25°-0'
8:00	4:00	126°-30'	8°-30'
7:10	4:50	119°-0'	0°-0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°-0'	55°-0'
10:00	2:00	135°-0'	45°-0'
8:00	4:00	108°-30'	24°-0'
6:00	6:00	90°-0'	0°-0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°-0'	78°-30'
11:00	1:00	127°-30'	72°-30'
10:00	2:00	105°-30'	61°-30'
8:00	4:00	85°-30'	37°-0'
4:50	7:10	61°-0'	0°-0'



It's what's *INSIDE* that Counts!

YES..."ingredients" make the big difference in quality of performance whether the product is a fine watch or a fine building material.

Secret of the success of so many Celotex building products, for example, is the cane fibre at their core.

These long, tough cane fibres form an interlocking "bridge" with each other—endow Celotex board with high tensile strength and endurance, good insulating value, yet extreme lightness and workability. It's easy to handle, easy to apply, economical to use.

What's more—special Celotex processing renders the board wind, water, heat, cold and vermin-resistant ... makes it one of the most practical building materials on the market.

Look to The Celotex Corporation for these quality cane fibre building products. And remember: on literally *millions* of building jobs, they've *proved* beyond a shadow of a doubt that *they've got the inside quality that counts!*

Quick Facts **on Celo-Siding—a typical Celotex cane-fibre building material**

Ideal for farm structures, garages, warehouses, most any low-cost building. Does 4 jobs in one application: 1. Sheathing; 2. Insulation; 3. Exterior Finish; 4. Structural Strength. Has high insulating value; requires no maintenance. Just nail to frame and caulk—and the job's done!

Tongue and Groove joint on long edges of 2′ x 8′ panels.

Core of genuine Celotex Cane Fibre Board furnishes structural strength and insulation.

All edges and sides sealed against moisture by coating of asphalt.

Extra coating of asphalt on exterior side.

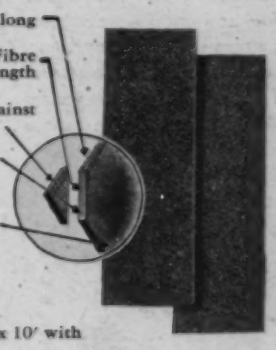
Exterior surface of firmly imbedded mineral granules, providing durable, colorful finish.

Colors: Green or Bufftone.

Sizes: 1/2″ thickness—4′ x 8′ with square edges.

7/8″ thickness—2′ x 8′ with T & G joints on long edges.

7/8″ thickness—4′ x 8′ and 4′ x 10′ with square edges.

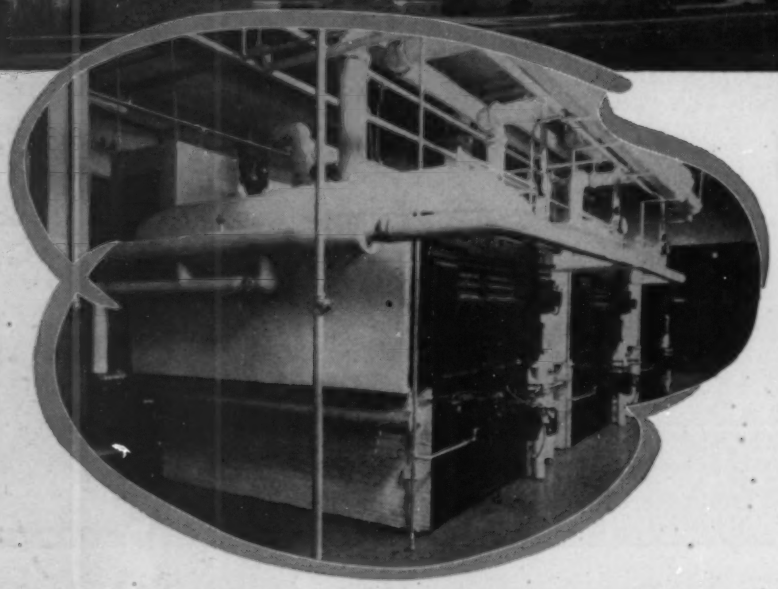


CELOTEX

REG. U.S. PAT. OFF.

BUILDING PRODUCTS

THE CELOTEX CORPORATION • CHICAGO 3, ILLINOIS



Junior and Senior High School, Harrison, N. Y. Architect, Robert Vignola, Harrison, N. Y.; Associate Architect, H. H. Knappe, New York City; Consulting Engineers, Daniel & Wallen, New York City; Heating Contractor, John Winkel Co., Inc., Larchmont, N. Y. Boiler Plant consists of three 20-section #60 Smith Cast Iron Header Type Boilers.

Boiler Plant...

for the POST WAR SCHOOL

City school operating officials are obviously in a favorable position to compare fuel and maintenance costs of various types of heating systems. Basing their findings on long term studies of these operating expenses it is significant that more and more school departments regularly specify H. B. SMITH boilers as standard equipment for their buildings.

Architects and Engineers who are now confronted with the specification of heating systems for public schools to be built post war would do well to study installations in like projects erected immediately pre-war to find the answers to many of their questions.

It is our prediction that as far as actual heat generation is concerned, the boiler plant of the 194? school will closely resemble the best installations of 1941. Recently built schools such as Westchester's Harrison High have set the standard for post war school heating.

H. B. SMITH cast-iron boilers installed in hundreds of recently built schools have not only been capable of that flexibility of performance needed by modern heating and air conditioning systems, but have proven themselves adaptable to the use of different fuels and methods of firing forced by the events of the last three years. Despite reductions in the amount of fuel available these SMITH boilers have operated with characteristic economy, reflecting credit on both their specifiers and installers.

It is this proven performance that makes an H. B. SMITH specification the best bet for today's planners of tomorrow's schools.

Complete engineering data and specifications of H. B. SMITH Boilers are filed in the Domestic Engineering Directory and Sweet's "Engineering."

H.B. *Smith*
CAST-IRON BOILERS

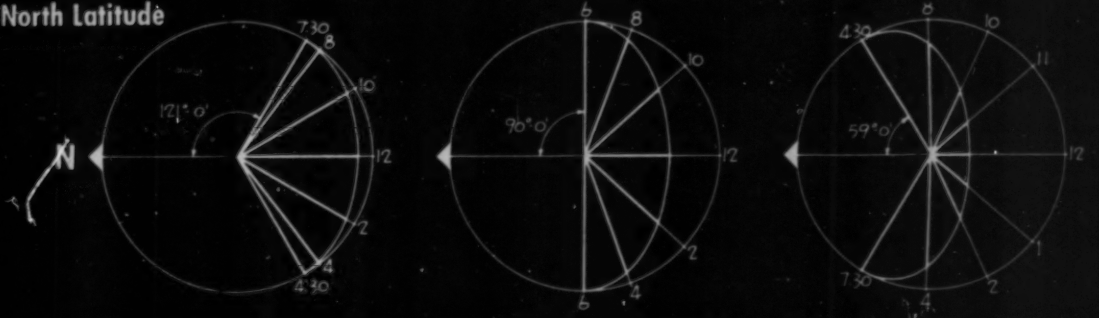
THE H. B. SMITH COMPANY, INC. • WESTFIELD, MASS.

Branch Offices and Sales Representatives in Principal Cities

DIAGRAMS OF AZIMUTH AND ALTITUDE OF THE SUN

WINTER Dec. 22 FALL Sept. 23 March 21 SPRING June 22 SUMMER

40° North Latitude

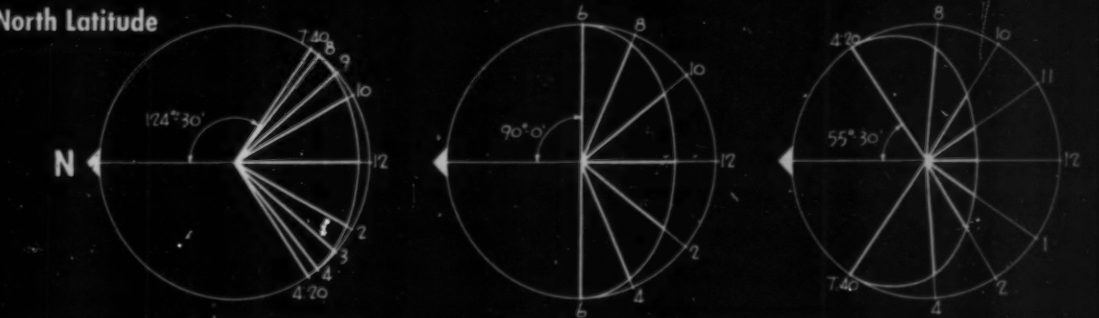


A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°- 0'	26°- 30'
10:00	2:00	150°- 30'	20°- 30'
8:00	4:00	127°- 0'	5°- 30'
7:30	4:30	121°- 0'	0°- 0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°- 0'	50°- 0'
10:00	2:00	138°- 0'	41°- 30'
8:00	4:00	110°- 30'	22°- 30'
6:00	6:00	90°- 0'	0°- 0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°- 0'	73°- 30'
11:00	1:00	138°- 0'	69°- 0'
10:00	2:00	114°- 0'	60°- 0
8:00	4:00	89°- 0'	37°- 30
4:30	7:30	59°- 0'	0°- 0'

45° North Latitude

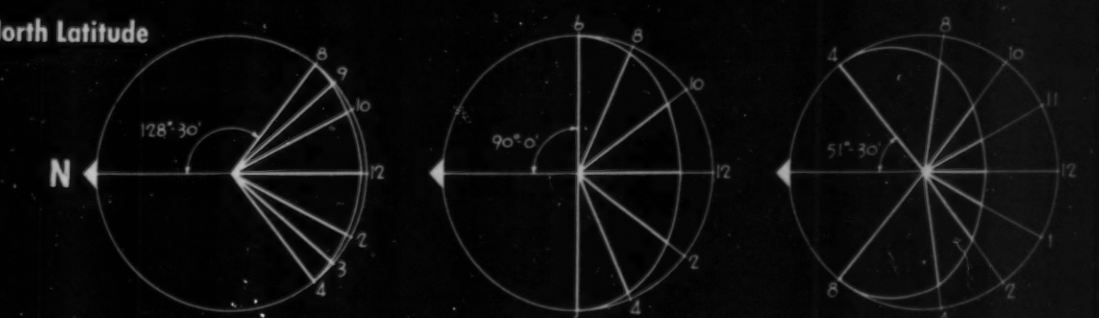


A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°- 0'	21°- 30'
10:00	2:00	151°- 30'	16°- 0'
9:00	3:00	139°- 0'	10°- 0'
8:00	4:00	127°- 30'	2°- 30'
7:40	4:20	124°- 30'	0°- 0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°- 0'	45°- 0'
10:00	2:00	141°- 0'	38°- 0'
8:00	4:00	112°- 0'	20°- 30'
6:00	6:00	90°- 0'	0°- 0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°- 0'	68°- 30'
11:00	1:00	145°- 30'	65°- 30'
10:00	2:00	121°- 30'	57°- 30'
8:00	4:00	93°- 0'	37°- 30'
4:20	7:40	55°- 30'	0°- 0

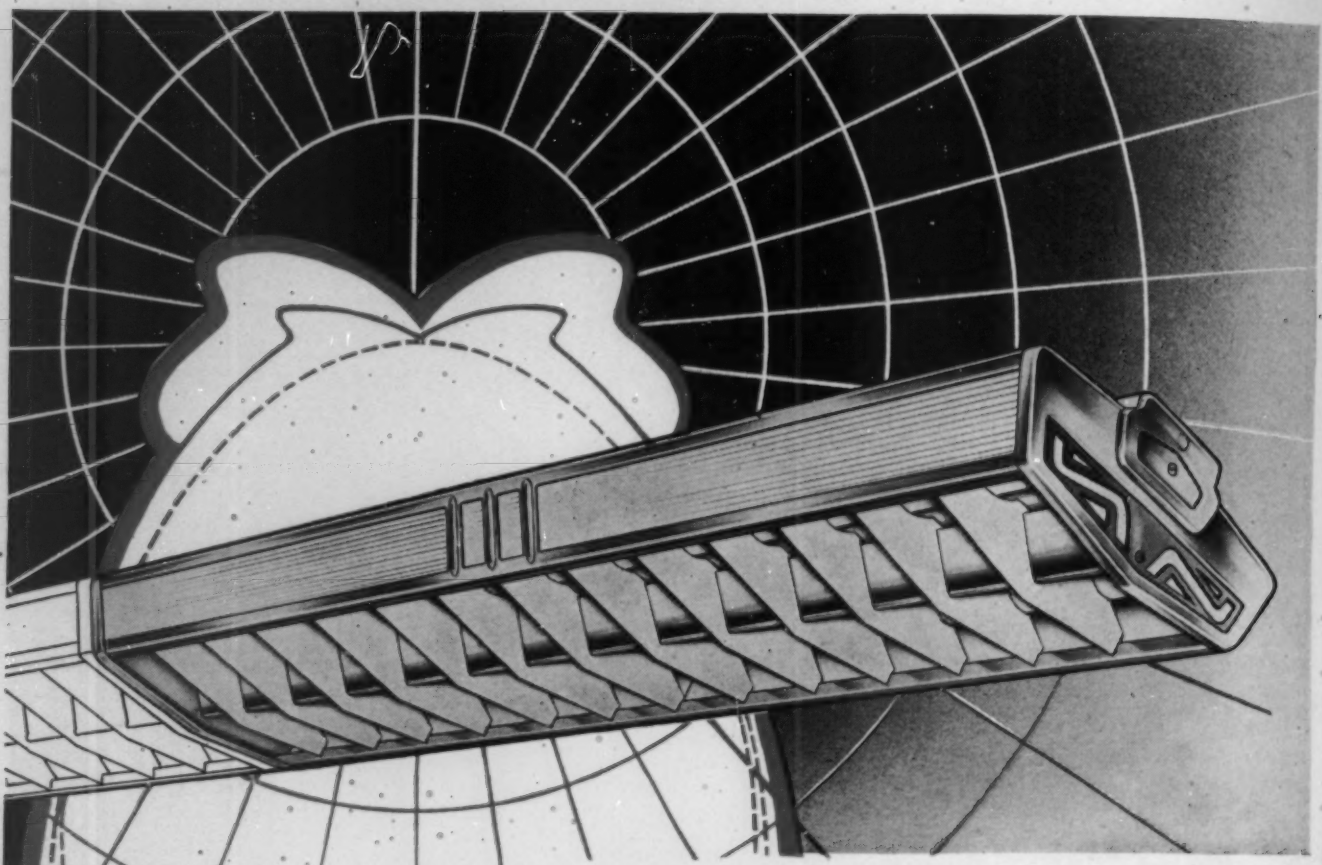
50° North Latitude



A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°- 0'	16°- 30'
10:00	2:00	152°- 0'	12°- 0'
9:00	3:00	139°- 30'	6°- 30'
8:00	4:00	128°- 30'	0°- 0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°- 0'	40°- 0'
10:00	2:00	143°- 0'	34°- 0'
8:00	4:00	114°- 0'	18°- 30'
6:00	6:00	90°- 0'	0°- 0'

A.M.	P.M.	AZIMUTH	ALTITUDE
NOON		180°- 0'	63°- 30'
11:00	1:00	150°- 30'	61°- 0'
10:00	2:00	127°- 30'	54°- 30'
8:00	4:00	97°- 0'	37°- 0'
4:00	8:00	51°- 30'	0°- 0'



FUNCTIONALLY DESIGNED ...OPTICALLY ENGINEERED

*M*odern, functional Day-Brite Fluorescent Fixtures combine better *light* with better *taste*.

Certified distribution curves prove their efficiency. A variety of pleasing designs to complement the architectural treatment of any installation requirement.

Send for our bulletins or consult your nearest Day-Brite Lighting Engineer for details.

The **VIZ-AID**—Patent V-shaped ALZAK louvers assure more even distribution of glareless light and provide more light on the working plane. For continuous or unit mounting—surface or suspension. Designed for two 40-watt lamps. U. S. Patent No. D-138990—others pending.

Day-Brite Lighting, Inc., 5465 Bulwer Avenue, St. Louis 7, Mo.
Nationally distributed through leading electrical supply houses.
In Canada: address all inquiries to Amalgamated Electric Corp., Ltd., Toronto 6, Ont.

961

IT'S EASY TO SEE WHEN IT'S

DAY-BRITE Lighting

TABLE OF AZIMUTH AND ALTITUDE OF THE SUN

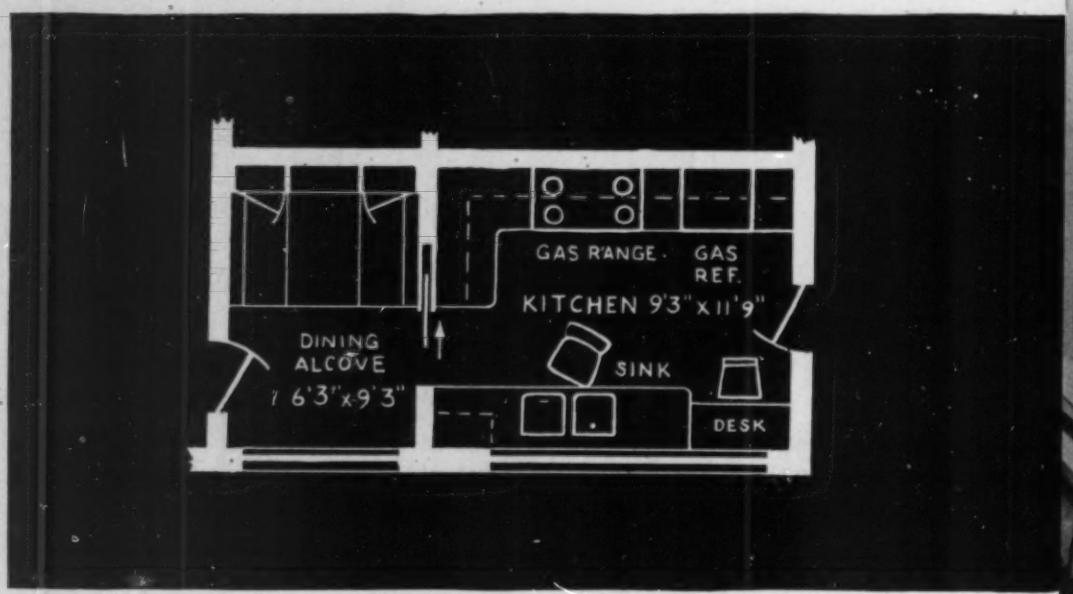
From Latitude 0° to 20° N. and 55° N. to 70° N.

	Dec. 22 WINTER			Sept. 23 FALL Mar. 21 SPRING			June 22 SUMMER		
	A.M.–P.M.	Azi.	Alt.	A.M.–P.M.	Azi.	Alt.	A.M.–P.M.	Azi.	Alt.
0°	Noon	180°–0′	66°–30′	Noon	90°–0′	90°–0′	Noon	0°–0′	66°–30′
	10–2	131°–0′	52°–30′	10–2	90°–0′	60°–0′	10–2	49°–0′	52°–30′
	8–4	116°–30′	27°–30′	8–4	90°–0′	30°–0′	8–4	63°–30′	27°–30′
	6–6	113°–30′	0°–0′	6–6	90°–0′	0°–0′	6–6	66°–30′	0°–0′
5° N.	Noon	180°–0′	61°–30′	Noon	180°–0′	85°–0′	Noon	0°–0′	71°–30′
	10–2	135°–30′	49°–0′	10–2	98°–30′	59°–30′	10–2	54°–30′	55°–30′
	8–4	119°–0′	25°–0′	8–4	93°–0′	30°–0′	8–4	66°–0′	29°–30′
	6:10–5:50	114°–0′	0°–0′	6–6	90°–0′	0°–0′	5:50–6:10	66°–30′	0°–0′
10° N.	Noon	180°–0′	56°–30′	Noon	180°–0′	80°–0′	Noon	0°–0′	76°–30′
	10–2	139°–0′	45°–30′	11–1	123°–0′	72°–0′	11–1	45°–0′	70°–30′
	8–4	120°–30′	22°–30′	10–2	106°–30′	58°–30′	10–2	61°–0′	58°–30′
	6:20–5:40	114°–0′	0°–0′	8–4	95°–30′	29°–30′	8–4	68°–30′	31°–30′
				6–6	90°–0′	0°–0′	5:40–6:20	66°–0′	0°–0′
15° N.	Noon	180°–0′	51°–30′	Noon	180°–0′	75°–0′	Noon	0°–0′	81°–30′
	10–2	142°–0′	41°–30′	11–1	134°–0′	69°–0′	11–1	56°–30′	73°–30′
	8–4	122°–30′	20°–0′	10–2	114°–0′	57°–0′	10–2	68°–30′	60°–30′
	6:30–5:30	114°–30′	0°–0′	8–4	98°–30′	29°–0′	8–4	71°–30′	33°–0′
				6–6	90°–0′	0°–0′	5:30–6:30	65°–30′	0°–0′
20° N.	Noon	180°–0′	46°–30′	Noon	180°–0′	70°–0′	Noon	0°–0′	86°–30′
	10–2	144°–30′	37°–30′	11–1	142°–0′	65°–0′	11:40–12:20	52°–0′	84°–0′
	8–4	124°–0′	17°–0′	10–2	120°–30′	54°–30′	11–1	73°–0′	75°–30′
	6:40–5:20	115°–0′	0°–0′	8–4	101°–0′	28°–0′	8–4	74°–30′	34°–30′
				6–6	90°–0′	0°–0′	5:20–6:40	65°–0′	0°–0′
55° N.	Noon	180°–0′	11°–30′	Noon	180°–0′	35°–0′	Noon	180°–0′	58°–30′
	10–2	152°–30′	7°–30′	10–2	145°–0′	30°–0′	11–1	154°–30′	56°–30′
	9–3	139°–30′	3°–0′	8–4	115°–30′	16°–30′	10–2	132°–30′	51°–30′
	8:30–3:30	134°–30′	0°–0′	6–6	90°–0′	0°–0′	8–4	100°–30′	36°–0′
							3:30–8:30	45°–30′	0°–0′
60° N.	Noon	180°–0′	6°–30′	Noon	180°–0′	30°–0′	Noon	180°–0′	53°–30′
	11:20–12:40	171°–0′	6°–0′	10–2	146°–30′	29°–30′	10–2	137°–0′	48°–0′
	10–2	153°–0′	3°–0′	8–4	116°–30′	14°–30′	8–4	104°–0′	35°–0′
	9:10–2:50	143°–0′	0°–0′	6–6	90°–0′	0°–0′	6–6	77°–30′	20°–0′
							2:50–9:10	37°–0′	0°–0′
65° N.	Noon	180°–0′	1°–30′	Noon	180°–0′	25°–0′	Noon	180°–0′	48°–30′
	10:30–1:30	162°–0′	0°–0′	10–2	147°–30′	21°–30′	10–2	140°–0′	44°–0′
				8–4	117°–30′	12°–0′	8–4	107°–30′	33°–30′
				6–6	90°–0′	0°–0′	6–6	79°–30′	21°–0′
							1:30–10:30	14°–30′	0°–0′
70° N. Sun does not rise from about Nov. 22nd to Jan. 21st				Noon	180°–0′	20°–0′	Noon	180°–0′	43°–30′
				10–2	148°–30′	17°–0′	10–2	143°–0′	40°–30′
				8–4	118°–30′	10°–0′	8–4	110°–30′	36°–0′
				6–6	90°–0′	0°–0′	6–6	81°–30′	22°–0′
							4–8	54°–30′	12°–30′
							Midnite	0°–0′	3°–30′

Why your clients would

This is no case of conjecture or "wishful thinking." We actually tested this "New Freedom Gas Kitchen" in a recent survey. And we found out exactly why this kitchen meets with enthusiastic approval among the very women from whom you draw your clientele.

Here's the story in their own words —



RE THE LAYOUT: "I like the all-in-one arrangement." "It's compact and practical." "Cabinets flush with the floor mean less cleaning." "There's plenty of light and storage space." "The sink directly across from the range saves you steps." "The breakfast room is so gay. Convenient, too."

RE THE DECORATIVE TREATMENT: "The colors are so bright and cheerful." "You won't tire of that color scheme." "It's good for summer or winter." "Looks cool and easy to clean." "I like the glass door — the black frame won't show fingermarks."

RE THE EQUIPMENT: "The new Gas equipment is certainly up to the minute!" "I'm sold on flame-cookery with Gas — it's fastest, cheapest, and easiest to regulate." "My new refrigerator will be run by Gas. It's noiseless — and more dependable." "I prefer Gas for everything. I've always found it completely satisfactory because it gives uninterrupted service."

d like a kitchen like this!

THERE'S NO DOUBT ABOUT IT! Gas is the overwhelming favorite as a kitchen fuel! Over 20,000,000 urban and suburban women are cooking with Gas now — want Gas ranges, Gas refrigerators and water heaters in their easy-to-work-in, *modern* homes. Capitalize on this preference by specifying Gas for every home you build or plan. And remember it pays to recommend Gas for the most effective house heating and air conditioning. See your local Gas Company for complete technical details on modern Gas practice, appliances and systems.

AMERICAN GAS ASSOCIATION

 (*Continued from page 22*)

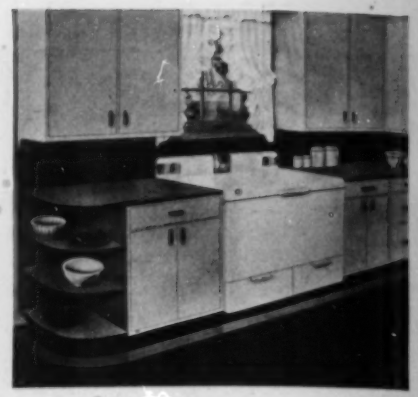
sure is announced. This safety flue eliminates multiple joints, and is tested to withstand 2400° F. New Castle Refractories, Dept. 16, New Castle, Pa.

KITCHEN CABINETS

A new line of steel kitchen cabinets is announced for which it is claimed that a receding-front principle on which their design is based provides additional comfort to the housewife. For simplification of maintenance, surfaces inside and out have been designed to prevent deposit of dust and dirt. American Central Manufacturing Corp., Connersville, Ind.

HOME FREEZER

A new home freezer, the *Pak-A-Way*, is designed as built-in equipment for new or modernized unit kitchens. In addition to fast freeze and refrigerated storage space, has two unrefrigerated drawers. Schaefer, Inc., 1000 Hodgson Building, Minneapolis 1, Minn.

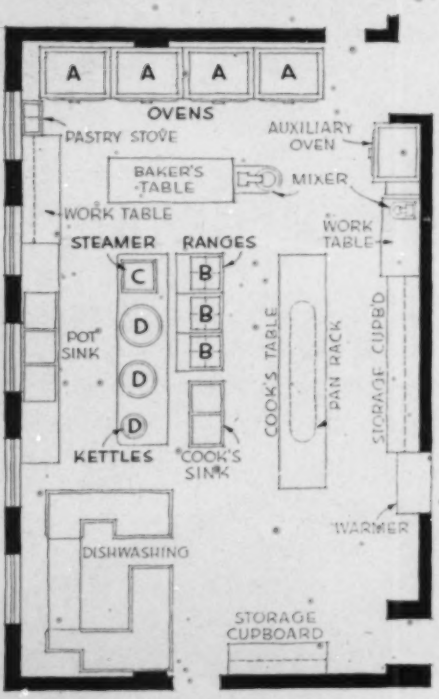


Freezer for Unit Kitchens.

KITCHEN PLAN NO. 33:

Thirty-third of a series of successful mass-feeding kitchen plans.

The Withrow High School at Cincinnati, Ohio, has for many years found "Specialized Cooking Tool Operation" successful. Several thousand hot meals daily are prepared in this installation.



KEEP FOR HANDY REFERENCE!

COOKING EQUIPMENT USED:

(a) 4 FOUR DECK, TWO SECTION, BLODGETT BAKING AND ROASTING OVENS
(b) 3 open top ranges
(c) 1 vegetable steamer
(d) 3 stock kettles

Designed and installed by:
H. Lauber & Co., Cincinnati, Ohio

Effective and speedy production is the key-note of this installation. Foods of a very varied menu are found to be better, more easily prepared, and more palatable, with less waste in shrinkage or materials. The four two section BLODGETT OVENS above have a capacity of 32 baking or roasting pans, and hold as much as 2400 lbs. at each load. For details and specifications of BLODGETT OVENS, consult your equipment house or write

The G. S. BLODGETT CO., Inc.

50 Lakeside Avenue **Burlington, Vermont**

Reprints of this new series will soon be available to architects on request.

PORCELAIN ENAMEL

A super-opaque white porcelain enamel, *Tite-Wite*, has been developed, which makes possible the application of enamel nearly as thin as the best organic paint finishes. High reflections with very thin applications, and a high bonding strength are declared practically to eliminate chipping. O. Hommel Co., Pittsburgh, Pa.

KNOT SEALER

Development of a practically colorless, synthetic-resin knot sealer is announced by the Western Pine Assn. Exceptional performance is asserted to have been proven by tests. For information regarding firms producing the sealer write for Lab. Note No. 21, Western Pine Assn., Yeon Bldg., Portland 4, Oregon.

UNIT WINDOW

A "pressure seal" weatherstripping principle on a new double-hung window unit with removable sash eliminates the need for weights or other counter-balancing devices. The removable sash permit easy cleaning from the inside, also inside handling of screens and storm sash. Andersen Corp., Bayport, Minn.

1-WATT GLOW LAMP

Designed for use in an ordinary lamp socket or base plug, a new 1-watt fluorescent glow lamp is said to operate for at least a year, burning night and day. This lamp is suggested for hallways or bathrooms, or as a safety light at the head of stairs. Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J.

FEATHERWEIGHT PANELS

A new construction material of great strength has been announced. Made of a honeycomb of cloth or paper sandwiched between and bonded to thin sheets of aluminum, stainless steel, wood veneer or plastic, the new waterproof sheets are stated to be structurally far stronger than anything at the same weight now being manufactured. These sheets are already undergoing severe tests by sev-

(*Continued on page 138*)

Showing the essential construction stripped of stacks and partitions. Steel plate floor and structural stack columns are designed, fabricated, and spaced accurately to bookstack tolerances to accommodate the equipment shown in the floor plan.

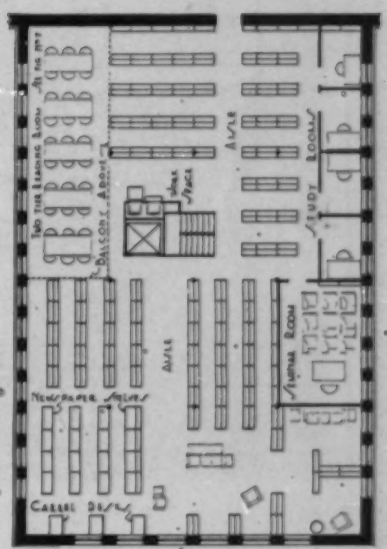
SNEAD STACK SYSTEM

Adaptable for various library requirements

Before the introduction of the Snead Stack System the layout of a new library was more or less a compromise between immediate requirements and those of the foreseeable future. Once completed, the fixed nature of the stackroom made it impractical to rearrange the layout radically to meet changing conditions.

With the Snead Stack System complete adaptability of space for any desired rearrangement is available at any time, and changes may be made quickly, easily, and inexpensively. The intermediate stack columns and shelves are removable, allowing the open space to be used for book storage, reading rooms, staff work space, carrels, offices, etc. Sections of the floor consisting of prefabricated steel plates covered with resilient tile may be removed to permit relocation of stairs, or for the formation of a full-height reading room within the stack area. Stacks may be rearranged without leaving marks on the floor or ceiling.

This multiplicity of uses of the stack area permits the cubical contents to be utilized fully as well as efficiently at all times. Send for catalog describing this revolutionary improvement in stack construction today.



A plan study showing adaptability of Snead Bookstacks. Structural stack columns are on 12 ft. by 18 ft. centers, and all shelving, study carrels, seminar room partitions, etc., can be removed or rearranged quickly and easily. This permits the stack area to be used interchangeably for book storage, staff work or readers, and makes the stack adaptable to meet the ever-changing demands of a library. Study and seminar rooms are enclosed by Snead Steel Mobilwalls.

SNEAD & Company . . . . . FOUNDED 1849

Designers, manufacturers and erectors of library bookstacks and steel partitions

Sales Office: 96 Pine Street, JERSEY CITY 4, N. J. Main Office and Plant: ORANGE, VA.

 (*Continued from page 136*)

eral airlines which are using the material experimentally for aircraft flooring. Doors, frames and wall panels for home construction will soon be available. The Glenn L. Martin Co., Baltimore 3, Md.

ALUMINUM DOORHOLDER

For locations where a sturdy doorholder is required, the manufacturers of the *Doormaster* state their spring-loaded device brings to bear great pressure without slipping. Made of aluminum, the holder closely hugs the door and is held out of the way by a bullet catch when not in use. Swallow Airplane Co., Inc., Wichita 1, Kans.

PLASTIC DIFFUSERS

Efficient diffusion that reduces direct and reflected glare is obtained with the new plastic *PFC-100's* which easily snap on fluorescent lamps. Said to be more efficient than glass panels, the diffusers offer an inexpensive method of improving quality of illumination. The Edwin F. Guth Co., 2615 Washington Blvd., St. Louis 3, Mo.

AUTOMATIC WASHING MACHINE

A high degree of efficiency is claimed for a new washing machine soon to be placed on the market. Of standard cabinet height and little over 2 ft. square, it requires no special base or bolting to the floor. The *Apex* washer is completely automatic, and cleansing action is accomplished by a unique rocking motion. It is stated the machine requires no cleaning after use. The Apex Electrical Mfg. Co., Cleveland 10, Ohio.

ALUMINUM FLASHING

According to *American Roofer*, sheet aluminum is satisfactory for flashing provided that it is properly installed. However, it is stated that unless the sheeting is coated with a lacquer or other protective covering its use should be avoided where it will be exposed to free lime.

If aluminum sheeting is to be used in flashing a prepared or a built-up roof, it is always desirable to submit particulars to the research laboratory of one of the larger manufacturers.

DDT CEDAR WALLPAPER

Wallpaper made from cedar wood and treated with DDT is offered for lining cedar closets. This paper, which comes with adhesive already applied to the back, is patterned to simulate cedar boards. A package contains 48 ft. of 15 in. paper, and is wrapped in cellophane to seal in odor. Trimz Co., Inc., Merchandise Mart, Chicago 54, Ill.

HOME INTER-COM

A home intercommunication system is offered as a new convenience to the housewife. Easy to install and easy to operate, any number of stations may be installed and varied to suit changing requirements. Executone, Inc., 415 Lexington Ave., New York 17, N. Y.

WATERPROOFING

Serious leaks in basement walls can be stopped with *Bondex* hydraulic waterproofing, it is asserted. Recommended for treating major cracks and breaks, the material comes in powder form which is mixed with water on the job, sets slowly, and may be applied with brush or trowel. The Reardon Co., St. Louis, Mo.

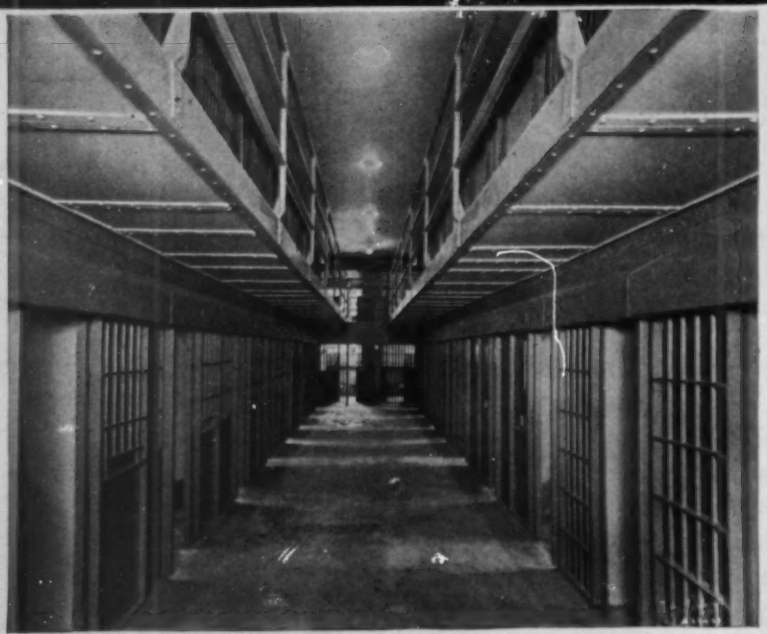
FIRE EXTINGUISHERS

Effective performance under all climatic conditions is claimed for *All-Out* dry chemical extinguishers. Ejected in a flat stream under pressure, the chem-

(*Continued on page 140*)

Stewart

JAIL AND PRISON EQUIPMENT



Our engineers will gladly give architects, builders and penal authorities the benefit of many years' experience in the jail building field. Layouts, estimates and complete information on grating and plate cells, doors, lock and locking devices, bunks, tables, seats and every accessory for new construction or the remodeling of old buildings. Stewart Non-Climbable Chain Link Wire Fence is ideal for jail yards and exercise areas. Full details sent on request.

THE STEWART IRON WORKS COMPANY, INCORPORATED

1377 Stewart Block - - Cincinnati 1, Ohio

"Designers and Builders of Jail and Prison Equipment Since 1886"

ASBESTOS IN ACTION

. . . on BIG jobs, it's

"Century" ASBESTOS CORRUGATED

. . . and little jobs, too

Many of the country's leading industrial plants enjoy the *advantages* of K&M "Century" ASBESTOS CORRUGATED roofing and siding.

WHY NOT HAVE THESE SAME ADVANTAGES IN *YOUR* PLANT?

TOUGHNESS . . . asbestos fibres and portland cement are combined under tremendous hydraulic pressure to form a sheet of asbestos corrugated.

ADAPTABILITY . . . suited for new construction or additions and repairs to existing structures. Comes in one standard width, and in 19 different lengths adaptable for every need.

ATTRACTIVENESS . . . does not require painting or surface finish of any kind . . . has its own pleasing, practical finish.

ECONOMY . . . an actual money-saver . . . is maintenance-free for the life of the structure. Will not rust or corrode.

FIRE-RESISTING . . . this means no risk, lower insurance rates and a completely fireproof wall and roof.

TIME-SAVING . . . installation time is reduced to a minimum, so, here too, low costs are maintained.

Save time and money the "Century" way . . . bring your problems to your authorized Keasbey & Mattison distributor. He is well supplied to meet your material and installation requirements for "Century" Asbestos Corrugated and Flat Lumber.

K&M best in asbestos

Nature made Asbestos . . . "Century" Asbestos Corrugated and Flat Lumber is an outstanding example of how Keasbey & Mattison has made Asbestos serve modern construction.

KEASBEY & MATTISON

COMPANY · AMBLER · PENNSYLVANIA

 (*Continued from page 138*)

ical forms no toxic gases, is a non-conductor of electricity, and the fire-smothering cloud that it forms shields the operator from radiant heat. The extinguisher is light, easy to operate and simple to refill. Pressurelube, Inc., 609 W. 134th St., New York 31, N. Y.

RECONVERSION

Plastic Glue

Supplies of *Weldwood* glue are once more available for civilian use. Of great strength, it is relatively waterproof, stain-free, bacteria and rot-proof, and holds joints shearproof and permanently bonded, according to the makers. United States Plywood Corp., 55 West 44th St., New York 18, N. Y.

Aluminum Windows

Having completed the largest aluminum window fabrication project ever handled, in which 4,500 windows were manufactured for the U. S. Army's Tripler General Hospital at Oahu, Hawaii, the makers of *Precision-Built* aluminum windows have started mass production for residential use. The company emphasizes the fact that the neutral color will blend with any style or color. Freedom from shrinkage and corrosion is assured, and windows require no painting, while built-in weatherstripping insures tightness. General Bronze Corp., 34-19 Tenth St., Long Island City, N. Y.

G. E. Reconverts

Announcing that the reconversion program has been completed, General Electric are once more producing all units of their electric kitchens, including cabinets. In their cabinet designs finish and hardware were coordinated with electrical appliances. Automatic interior lighting and work-surface lighting are provided. Flush tops on wall cabinets eliminate the necessity of furring down to close the space between cabinet and ceiling. General Electric Co., 1285 Boston Ave., Bridgeport 2, Conn.

Rubber Floor Paint

It is announced that *Paratex*, the rubber-base floor paint is again being produced. Recommended for use on concrete floors on or below grade because of its resistance to lime and moisture, the waterproof qualities of the rubber resin are also said to make it very effective in steel protection. Truscon Laboratories, Inc., Box 68, Milwaukee Jct. P. O., Detroit 11, Mich.

Explosive Rivets

Increased efficiency, ease and speed of making blind fastenings with the improved explosive rivets is claimed. They are well adapted for the construction of prefabricated housing, for attaching paneling and similar applications, for construction and sealing of air-conditioning ducts, etc. E. I. Du Pont de Nemours and Co., Wilmington 98, Del.

STANDARDIZATION

Metal lath manufacturers have cooperated on the standardization of types and sizes of their products. A booklet, *Metal Lath (Expanded and Sheet) and Metal Plastering Accessories*, gives in concise and orderly form the results of the studies made. Div. of Simplified Practice, National Bureau of Standards, U. S. Dept. of Commerce, Washington 25, D. C.

MODULAR SYSTEM

An explanation of *Modular Coordination as related to Building Design* for the architect and engineer has been prepared by the American Standards Association. This 16-page folder sets forth the application of the modular system to building plans, includes installation details for metal and wood windows. The Producers' Council, Inc., 815 15th Street, N.W., Washington 5, D. C.

Use the time-proved, dependable Barber-Colman **RADIO CONTROL** *for garage doors . . .*

We designed, built, and installed Radio Control for garage doors in 1926 — nearly 20 years ago! Between then and 1936 we redesigned the units several times, simplifying the equipment and improving its dependability of operation. For the last 9 years (except for the war period) we have been offering a successful system which has proved its reliability in hundreds of satisfactory installations. With indications of a growing demand for this outstanding convenience in post-war homes, we urge you to investigate the distinctive features of the BARBER-COLMAN Radio Control. Your Barber-Colman representative has complete information or, if you prefer, we will be glad to send you our descriptive literature. Be ready to specify BARBER-COLMAN time-proved, dependable RADIO CONTROL for garage doors!

BARCOL

FACTORY-TRAINED SALES and SERVICE REPRESENTATIVES IN PRINCIPAL CITIES

BARBER-COLMAN COMPANY

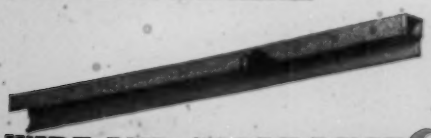
102 MILL ST. • ROCKFORD, ILL.

THAT'S THE TIME TO INSTALL

FA Busduct

PLUG-IN BUSDUCT

FEEDER BUSDUCT



WIRE AND CABLE DUCT

When you plan changes in the plant layout are you handicapped by an inadequate power distribution system? Does moving machines involve tearing up and restringing long, expensive wiring? Is heavy equipment forced to locate near the power source?

The answer to all these questions is "NO"— once FA BUSDUCT is installed. It provides *Plug-in* power source every foot of its length . . . enables machines to be running in *minutes* after locating . . . eliminates "cobweb" wiring systems, gives the plant layout unlimited flexibility for efficient work flow.

And FA Busduct *never* loses its value. Standard 10-foot sections assemble and dismantle speedily, permit extensions and step-down capacity tap-offs, and furnishes maximum efficiency in power distribution.

Our 20-page Bulletin No. 65 was made to help you with your planning. It gives specifications, prices and many helpful suggestions. Write for it today.

Frank Adam
ELECTRIC COMPANY

Makers of Busduct Panelboards · Switchboards

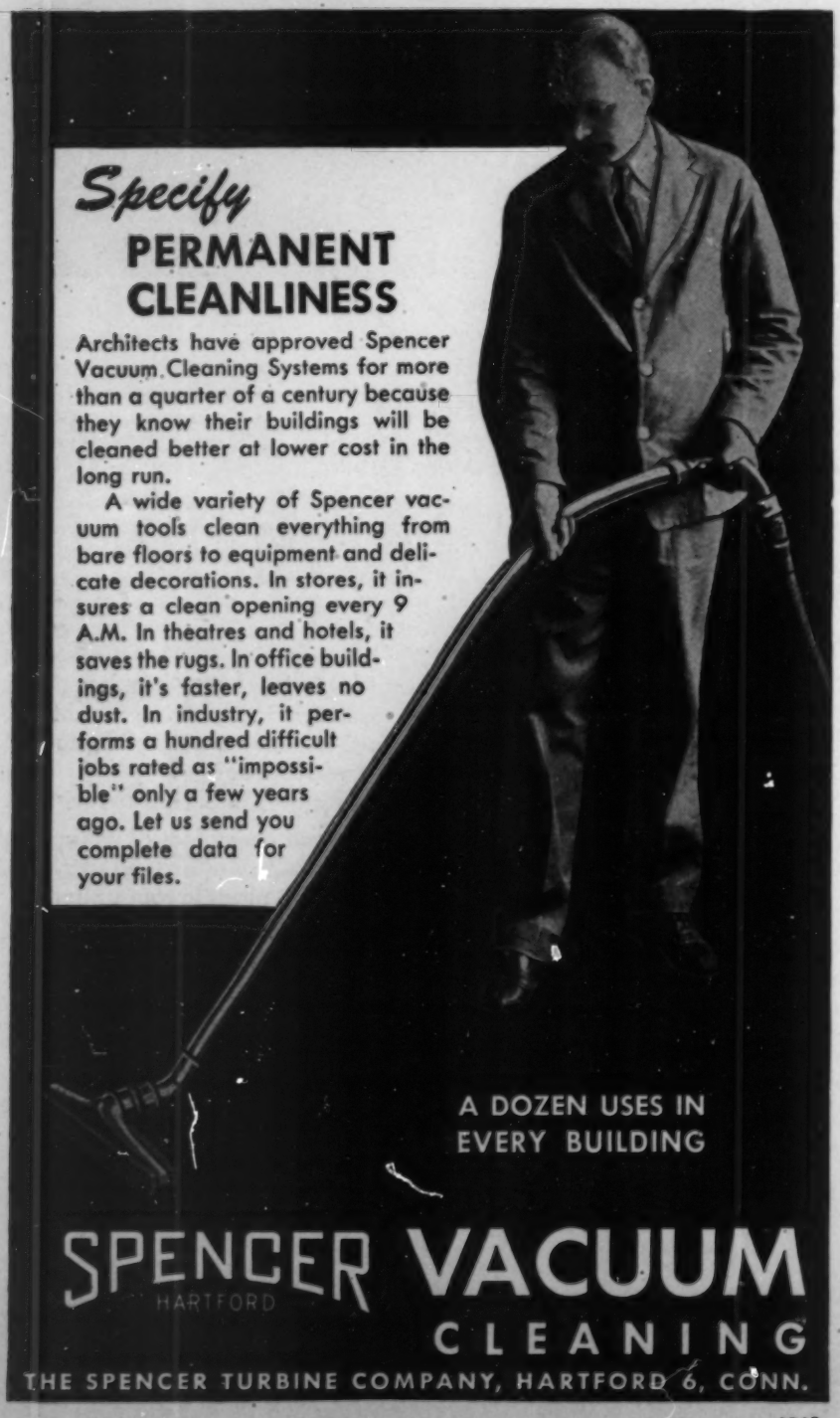
BOX 357, ST. LOUIS, MISSOURI

manufacturers and manufacturers of paint and other products which are directly related to light, will participate. During the exposition there will be a series of lighting conferences, including one on "New Lighting Trends and Methods."

SKYWAY PROPOSED

Proposed as a solution to New York City's traffic and housing problems is the Manhattan Inner Loop Skyway, a 27-mile housetop roadway routed through depreciated areas in a double loop around Manhattan's two concentrated districts and linked to an integrated block-wide system of housing, parking and terminal facilities.

Egmont Arens, New York industrial designer, is the author of this novel plan, which provides for a public garage system as an integral part of the highway setup, and parking space in every block of the Skyloop. Also provided are spaced towers, with landscaping between, which are intended to provide housing for 100,000 families in the low-income brackets as well as houses for the higher-income groups. Direct connection with existing peripheral highways would be provided.


Specify
PERMANENT CLEANLINESS
Architects have approved Spencer Vacuum Cleaning Systems for more than a quarter of a century because they know their buildings will be cleaned better at lower cost in the long run.
A wide variety of Spencer vacuum tools clean everything from bare floors to equipment and delicate decorations. In stores, it insures a clean opening every 9 A.M. In theatres and hotels, it saves the rugs. In office buildings, it's faster, leaves no dust. In industry, it performs a hundred difficult jobs rated as "impossible" only a few years ago. Let us send you complete data for your files.
A DOZEN USES IN EVERY BUILDING
SPENCER HARTFORD VACUUM CLEANING
THE SPENCER TURBINE COMPANY, HARTFORD 6, CONN.
256C

WINNERS ANNOUNCED

Winners of the 24 $1,000 awards in the recent Chicago Tribune's Chicagoland Prize Home competition include one woman and one double winner. Mrs. Lucile McKirahan of Stuttgart, Arkansas, wife of an Army lieutenant now in Japan, won one of the prizes. Lt. Ray Stuermer, U.S.N.R., of Chicago, who completed his drawings while serving as radar officer aboard the Cruiser St. Louis in the Pacific, won two awards. The other winners were: Edward L. Burch, Jr., Evanston, Ill.; Lt. (j.g.) W. R. Burns, Jr., Harrisburg, Pa.; Carl L. Cederstrand, Wilmette, Ill.; Merwin H. Freeman, Los Angeles; Raymond W. Garbe, Wheaton, Ill.; Edward H. Glidden, Jr. and Eben D. Finney, Baltimore; Joseph C. Gora, Boston; Edward W. Hanson, Stillwater, Minn.; Herbert C. Hanson and Henry Martorano, Chicago; Heidt Associates, Orange, Texas; George R. Klinkhardt, Berkeley, Calif.; Arthur R. Myhrum, River Forest, Ill.; Ens. Ralph DeLos Peterson, Jr., Gary, Ind., and Lt. Custis S. Woolford, Jr., South Orange, N. J.; Capt. Arthur Jack Sackville-West, Colorado Springs, Colo.; Charles W. Schroeder, Chicago; Frederick E. Sloan, Golf, Ill.; D. Coder Taylor, Evanston, Ill.; Walter J. Thies, Dayton, Ohio; Howard J. Uebelhack, Wilmette, Ill.; Eric Wenstrand, Chicago; J. Floyd Yewell, New York.

GALLERY OPENS

"Ideas for Better Living" is the title of the opening exhibition in the new Everyday Art Gallery of the Walker Art Center, Minneapolis. Some 1600 sq. ft. of permanent exhibition space on the first floor of the museum have been allocated to the new gallery, which is intended to serve as an information center for consumers and a gallery and library for homemakers. Other exhibitions already scheduled are: New Furniture, March-April; Industrial Designers, May-June; Contemporary Ceramics, July-August; If You're Going to Build a House, August-October; and Well Designed Articles from Twin Cities Stores, November-December. The present exhibition closes March 10.

USE FOR MODELS

From Lt. Paul F. Heinberg, of Dallas, comes the suggestion that instead of discarding them, architects give their unwanted building models to the blind. "These models," Lt. Heinberg writes, "would offer them [the blind] beauty in

(*Continued on page 144*)

Design C-6505 Design C-6554 Design C-6526 Design C-6561

Announcing: new scope for your home planning with this NEW Curtis Woodwork!

• To give you greater scope in planning homes of distinction—to help you fill America's demand for beauty, utility at moderate cost—Curtis announces its new line of stock architectural woodwork.

Here is a wide variety of design to fit every taste and to meet every building budget. Here is authentic styling created by well-known architects, adding distinguished beauty without "made-to-order" cost. And here is Curtis quality to make such beauty lasting!

Let this new Curtis Woodwork help put extra value, extra utility into the homes you plan and build—in modernization work, too. Mail the coupon for complete, illustrated literature.

Beauty at economical cost for moderately priced homes in Curtis Entrance C-1750. Cameron Clark, Architect.

Curtis Entrance C-1735 is a modern adaptation of an entrance found in early Colonial homes. Willis Irvin, Architect.

Curtis Entrance C-1730 recalls many fine doorways found in Connecticut and Massachusetts. Note the entablature with its bowed face, dentil course and pilaster beading. H. Roy Kelley, Architect.

Modernized Georgian in design—modern in feeling—this new Curtis mantel has simple ornaments applied on a bowed fascia. Design C-6043 is one of fifteen mantels in the Curtis line. George W. Stoddard, Architect.

Curtis Mantel Design C-6056, an adaptation of the Pennsylvania farm home type mantels often seen near Valley Forge. Willis Irvin, Architect.

This stairway, made up of stock parts, illustrates the delicacy and beauty which can be obtained from Curtis stairwork of various styles.

In Canada:
W. C. Edwards & Co., Ltd.
991 Somerset St., West
Ottawa, Canada

1866 CURTIS WOODWORK

CURTIS COMPANIES
SERVICE BUREAU
Dept. AR-3W, Curtis Building, Clinton, Iowa

Gentlemen: Please send literature on the new Curtis Woodwork line and the name of the Curtis dealer in this locality.

Name.....

Address.....

City..... State.....

a manner scarcely found outside their world of literature." Any institution for the blind probably would be happy to receive such models.

APPOINTMENTS

Henry E. Price has been appointed executive director and counsel of the National Real Estate Foundation. He will have the responsibility of perfecting the Foundation's machinery for studying taxation and other problems affecting property owners, particularly small home owners, and will supervise the organization of Home and Property Owners of America, a division of the Foundation.

Charles F. Rand has been appointed senior housing consultant in the New York State Division of Housing's community development service. Mr. Rand was formerly executive secretary and project manager of the North Tonawanda, N. Y., Housing Authority.

Franklin D. Richards has been appointed to the newly created position of Assistant Commissioner, Field Operations, of the FHA. He has been with the Administration since 1934.

ELECTIONS

W. W. Horner, St. Louis consulting engineer, has been elected president of the American Society of Civil Engineers for 1946.

Dr. Edison Junqueira Passos, civil engineer of Rio de Janeiro, Brazil, has been elected executive vice president of Aerovias Brasil, associated company of TACA Airways of Latin America.

Delos Walker, vice president of R. H. Macy & Co., and Earl B. Schwulst, vice president of the Bowery Savings Bank, New York, have been elected vice president and treasurer, respectively, of the Regional Plan Association.

AWARDS MADE

Library of Congress

Frances Troy Schwab, of Boston, Mass., has been awarded a year's grant by the Library of Congress in their History of American Civilization series, the grant to be used to complete work on a book. Miss Schwab, who writes a weekly column on "What's New for the Home" for the St. Louis *Globe-Democrat* and the New Bedford *Standard-Times*, is the author of the "Victorian Prototypes of the Present" article in the September, 1945, issue of the ARCHITECTURAL RECORD.

A.S.H.V.E. Medal

Capt. A. E. Stacey, Jr., U.S.N.R., of Essex Fells, N. J., has been awarded the F. Paul Anderson Gold Medal of the American Society of Heating and Ventilating Engineers, for his outstanding contributions to the advancement of heating, ventilating and air conditioning.

COLLEGE NOTES

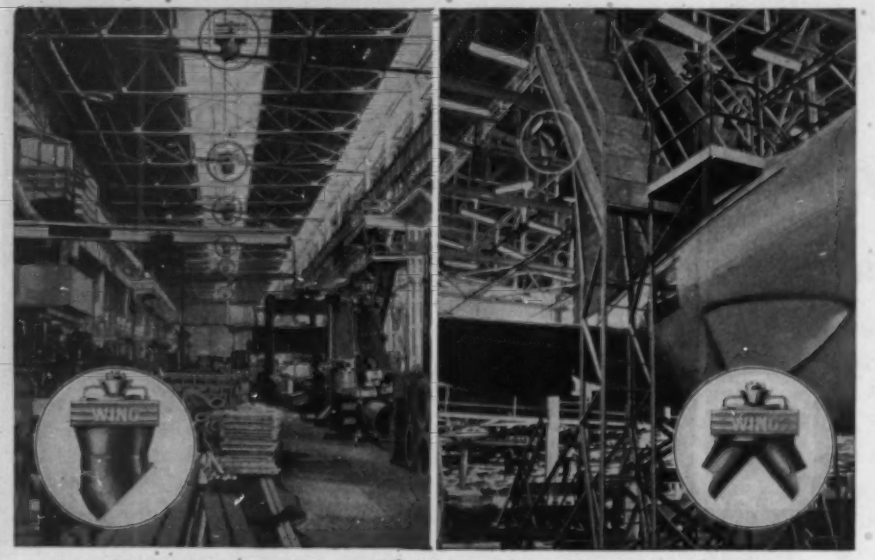
Seminar in Housing

Harvard University has announced a seminar in housing, to be conducted by Catherine Bauer during the spring term, 1946. The seminar will be concerned with the nature and extent of the housing problem, the background and achievements of the housing movement in Europe and America, and the issues involved in the formulation of a comprehensive national housing policy. The class will be limited in size, and applicants will be interviewed.

New Course Announced

The Extension Division of the University of Wisconsin is announcing a new course, taught by the correspondence-study method, entitled "Stress Analysis of Rigid Building Frames, Slope Deflection Method," for engineers and designers. After developing the general

(*Continued on page 146*)



WING *Revolving* HEATERS

Help Keep Shipbuilders (Sea and Air) on the Job

Two striking instances of the virtues of Wing Revolving Unit Heaters are exemplified in the photographs above.

At the left is one of the shops of a large shipbuilding concern where the **Wing Revolving Heaters are located 61 feet above the shop floor.** Yet the heated air is projected down to the working level and circulated by the **slowly revolving outlets** of the heater so that every part of **this huge shop (802 ft. x 156 ft.) is kept warm and comfortable,** protecting the health of workers and keeping production moving.

At the right is part of the asembly shop of one of the worlds largest builders of cargo planes, the merchant ships of the air. This modern plant is also heated by **Wing Revolving Unit Heaters. No other type of heater could so thoroughly and evenly heat a plant of this kind,** where the massive planes would form imposing obstacles to the projection of heated air from fixed discharge heaters. But the slowly moving streams of warm air from the revolving discharge outlets of the Wing heaters **circulate around and under the huge plane bodies, wings, rudders, stabilizers, etc.,** and keep the plant at a uniform, comfortable temperature. Employees find that the sensation of warm, live, invigorating comfort is stimulating to production. **And in summer, with the steam turned off, and the fans on, an equally pleasant cooling effect may be obtained.**

Write for a copy of Wing Bulletin HR-4

Wing

L. J. Wing Mfg. Co.,
151 W. 14th Street New York 11, N. Y.
Factories: Newark, N. J. and Montreal, Canada

Sure protection... Easy installation

with ANACONDA THROUGH-WALL FLASHING

YOU CAN READILY SEE from this illustration why Anaconda Through-Wall Flashing is known as "the flashing that drains itself dry on a level bed." The die-stamped dam and corrugations provide positive drainage in the desired direction, intercepting and disposing of wind-driven rain and moisture penetrating the masonry.

Equally evident is the fact that this preformed flashing is easy to install. Because of the flat selvage, sharp bends for counter flashing, or for locking to adjacent metal, are easily made. And merely by nesting one or two corrugations, Anaconda Through-Wall Flashing is readily locked endwise to form water-tight joints.

The photograph below shows the Grafton, West Virginia, High School, in which this durable, rustproof flashing provides positive protection against seepage, and decreases the risk of heaving by frost.

For detailed information on Anaconda Through-Wall Flashing, write for Publication C-28.

• *Grafton, W. Va., High School, equipped with Anaconda Through-Wall Flashing. Carleton Wood, Clarksburg, W. Va., Architect; Fuel City Metal Works, Clarksburg, W. Va., Sheet Metal Contractor.*

ANACONDA

Anaconda

COPPER

THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

Subsidiary of Anaconda Copper Mining Company

In Canada: ANACONDA AMERICAN BRASS LTD., *New Toronto, Ont.*

slope deflection theory, the course makes a practical application of the theory in the stress analysis of rigid building frames as constructed of steel and of reinforced concrete and subjected to live and dead vertical loadings and to horizontal loadings from wind and earthquakes.

The course, in 24 assignments, is based on a textbook and supplementary material. A prerequisite is a good working knowledge of engineering mechanics (statics), strength of materials, and essentials of structural theory. For further information address the Civil and Structural Engineering Dept., of the University Extension Division, Madison, Wis.

Acoustics Laboratory

Establishment of an acoustics laboratory, a new interdepartmental facility in a branch of science which produced important developments during the war, has been announced by the Massachusetts Institute of Technology. One of the primary objectives of the new laboratory is to provide fundamental professional training in a field in which there is now a serious shortage of competent engineers and scientists.

The new laboratory is to be operated under the joint direction of the Institute's departments of physics and electrical engineering and the school of architecture and planning. It will collaborate with all departments interested in acoustic problems. Dr. Richard H. Bolt, assistant professor of physics, has been appointed director.

Fellowship Offered

The School of Architecture of Princeton University has announced the availability of the Lowell M. Palmer Fellowship in Architecture, the purpose of which is to enable a student of unusual promise to undertake the advanced study of architecture at Princeton, and to take advantage of the opportunities offered by the close affiliation of the School of Architecture, the Bureau of Urban Research, the Department of Art and Archaeology, and the other graduate departments of the University.

The Palmer Fellow is exempt from tuition fees and will receive a stipend of $700 during his year of residence at Princeton. Applicants must hold a Bachelor's degree, must be citizens of the United States, less than 27 years of age on October 1, 1946, and in good physical condition.

Application blanks may be obtained from the Secretary of the School of Architecture, Princeton University, Princeton, N. Y. Applications must be received not later than March 25, 1946.

Fellowship Announced

Announcement has been made by the University of Illinois of the 15th annual consideration of candidates for the Kate Neal Kinley Memorial Fellowship.

The $1,000 fellowship is offered for a year's advanced study of the fine arts in America or abroad. Applicants must be graduates of an accredited college, must have majored in music, art or architecture, and should not exceed 24 years of age on June 1, 1946. Applications should be received not later than May 1, 1946. Requests for application blanks and instructions should be addressed to Dean Rexford Newcomb, College of Fine and Applied Arts, Room 110, Architecture Bldg., University of Illinois, Urbana, Ill.

Home Building Course

The Institute of Arts and Sciences of Columbia University has inaugurated a "practical course for the home builder." Consisting of a series of 10 Thursday evening lecture-discussions by Frederick J. Woodbridge and Harold H. Sleeper, the course is offered in cooperation with

(*Continued on page 148*)

What makes a LONGSPAN Outstanding?

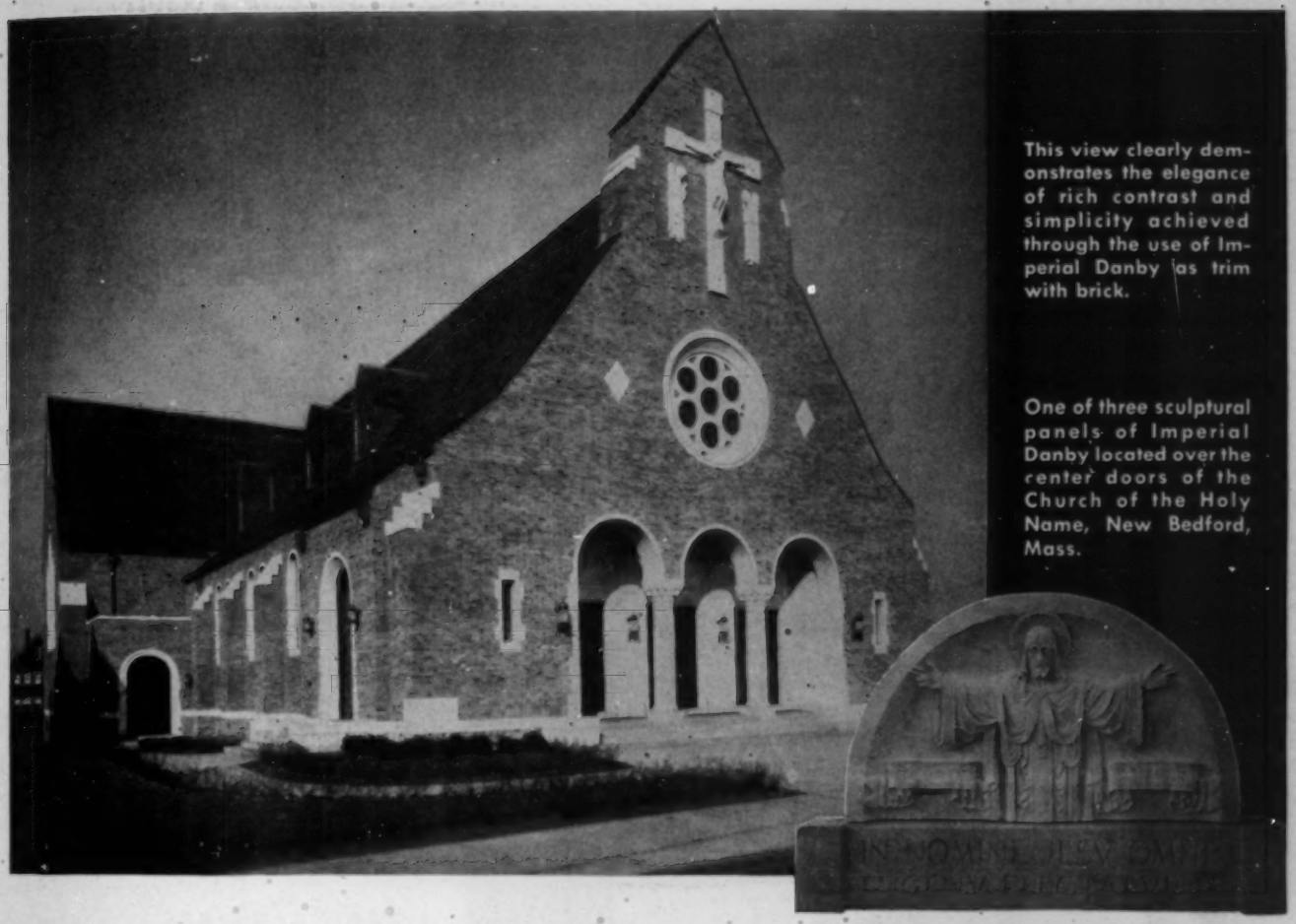
Look for the U-shaped diagonal web. It provides an excellent welding condition and a constant chord spread that results in outstanding lateral rigidity. This exclusive Macomber design is made in underslung or square end types with sloping or parallel chords in lengths up to 70 feet. Here is a completely standardized structural unit, specified from load and span tables for unobstructed floor or roof support. Get our complete design information for your next project.

STEEL JOISTS
ROOF PURLINS
ROOF TRUSSES
LONGSPANS
ROOF DECKING
STEEL SIDING

MACOMBER
CANTON • OHIO
MEMBER OF THE STEEL JOIST INSTITUTE

Limitless Versatility

VERMONT MARBLE



This view clearly demonstrates the elegance of rich contrast and simplicity achieved through the use of Imperial Danby as trim with brick.

One of three sculptural panels of Imperial Danby located over the center doors of the Church of the Holy Name, New Bedford, Mass.

Whether chosen for attractive appearance or rugged durability, marble work of high quality and matchless beauty assures endless satisfaction to architect and owner alike. That is why so many architects choose Imperial Danby Marble.

They know that the limitless versatility of Imperial Danby makes it the perfect answer to the complete marble structure, a few pieces of decorative trim or simple, durable window sills.

An excellent example of the varied use of this fine stone as trim and decorative panels with brick is the Church of the Holy Name, New Bedford, Mass., designed by Maginnis & Walsh, Architects.

The Vermont Marble Company, producers, importers and finishers, maintain branch offices in principal cities to serve you.

VERMONT MARBLE

Enduring Beauty

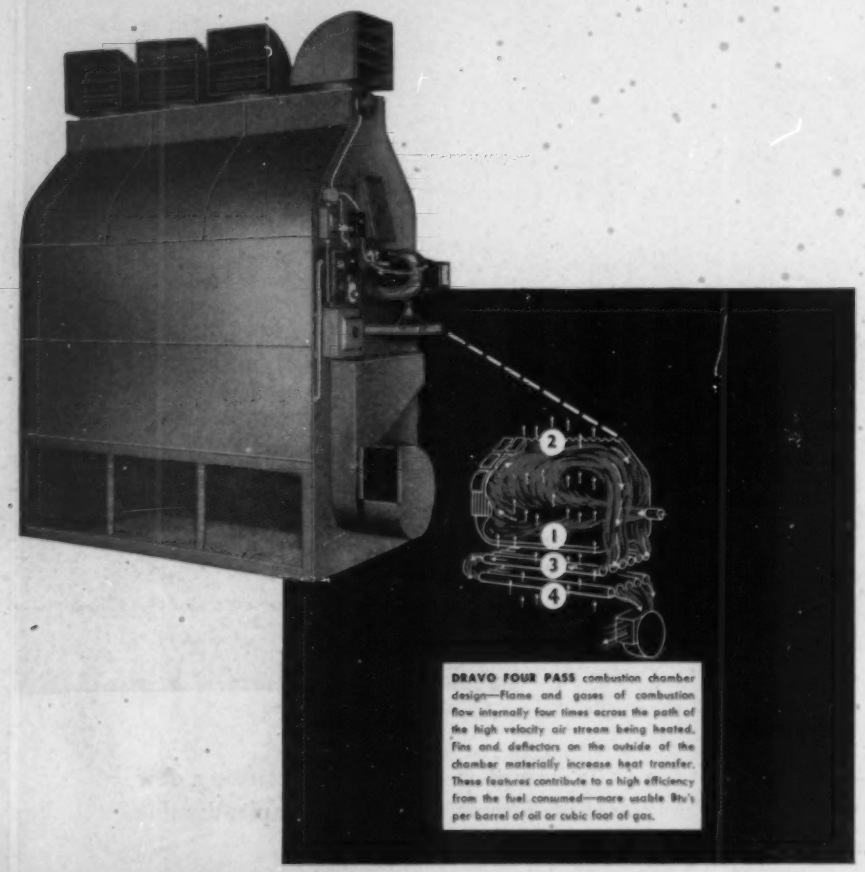
VERMONT MARBLE COMPANY • PROCTOR, VERMONT

Boston • Chicago • Cleveland • Dallas • Houston • Los Angeles • New York • Philadelphia • San Francisco • Ontario Marble Co., Peterborough, Ont.

the School of Architecture. The lectures, covering such subjects as financing, relationship of house and lot, planning, heating, etc., will continue through April 11.

LECTURE SERIES

A series of six lectures entitled "The House I Want" will be given at the Twentieth Century Club, Berkeley, Cal., and the San Francisco Museum of Art, San Francisco, on Thursdays from March 7 through April 11. Presented by the Women's Architectural League, the lectures are sponsored by the San Francisco Museum of Art and the Northern California Chapter of the A.I.A. Architect speakers will be Gardner A. Dailey, John S. Bolles, Paul R. Williams, Pietro Belluschi and William Clement Ambrose. Other speakers include landscape architects Thomas D. Church and Edward A. Williams; decorators Maurice Sands and Frances Elkins; realtor Raymond D. Smith; textile designer Dorothy Liebes.



DRAVO FOUR PASS combustion chamber design—Flame and gases of combustion flow internally four times across the path of the high velocity air stream being heated. Fins and deflectors on the outside of the chamber materially increase heat transfer. These features contribute to a high efficiency from the fuel consumed—more usable Btu's per barrel of oil or cubic foot of gas.

Economical Heat Exchanger
Uses Direct Fuel-to-Air Principle
For Large Scale Space Heating

This heater employs an efficient direct heat transfer method – through only one thickness of metal – the cool air crosses the path of the flame and gases four times before it is discharged by high velocity fans into the area to be heated.

Efficiencies run high – 80 to 85% – this fact together with minimum requirements of maintenance and care, makes the Dravo designed direct fired warm air heater a logical choice where large, unobstructed areas are to be heated.

Dravo heaters are shipped from the factory complete, with refractory material installed. When gas or oil is the fuel they need only be connected to the fuel and power lines and they are ready to operate. They can be moved from place to place to meet supplementary heat requirements. They can be operated individually if a portion of the plant is shut down. Maintenance is negligible. No specialized attendance is required. For the whole story ask for Bulletin 509-A. Address Dravo Corporation, Heater Department, 300 Penn Avenue, Pittsburgh 22, Pa.

DRAVO HEATING

300,000 TO 1,650,000 B. T. U. CAPACITY. MULTIPLE UNITS COMBINE FOR ANY OUTPUT

CHICAGO WINNERS

David S. Geer, Edward W. Waugh and George Matsumoto, all of the architectural office of Saarinen & Swanson, Birmingham, Mich., have been awarded the $10,000 first prize in the Chicago Herald-American's Better Chicago Contest. Second prize went to Ernest A. Grunsfield, Jr., Wallace F. Yerkes and William F. Koenig, of Chicago. Third prize winners were Ann Horn and Leroy Binkley, of Glencoe, Ill. Jerrold Loebl, A.I.A., of Chicago, served as professional adviser for the contest.

SCHOLARSHIP

The Managing Committee of the John Stewardson Memorial Scholarship in Architecture announces a competition for a scholarship of the value of $1,000, the holder of which is to pursue the study of architecture in this or foreign countries as determined by the Committee and under its direction.

Citizens of the United States who shall have studied or practiced architecture in the State of Pennsylvania for the period of at least one year immediately preceding the scholarship award are eligible to compete. Also eligible are veterans whose military service took place after they had actually begun their study or practice of architecture in Pennsylvania.

Applicants are required to forward to the Committee not later than April 1, 1946, the information called for in the registration blank which may be had from the Secretary, Morton Keast, 1108 Commonwealth Bldg., 1201 Chestnut St., Philadelphia 7, Penn.

OFFICE NOTES

Offices Opened, Reopened

J. Norris Barnard, R.A., and Alden B. Wilson, Industrial Designer, announce the opening of their office, Allied Planners, for the practice of architecture and industrial designing, at 1611 Sansom St., Philadelphia 3, Penn.

Frederick B. Barss, Architect, announces the opening of an office at Room 225, Hansford Bldg., 268 Market St., San Francisco 11, Calif.

Henry L. Blatner, Architect, has opened an office at 11 N. Pearl St., Albany 7, N. Y.

Joseph Ceruti, A.I.A., has opened offices at 2915 Detroit Ave., Cleveland 13, Ohio.

G. Mallory Collins, Architect, has reopened his office at Highland Park Village, Dallas, Texas, following several years in the Army.

Arland A. Dirlam has returned from active duty with the Navy and has reopened his office for the practice of architecture at 673 Boylston St., Boston, Mass.

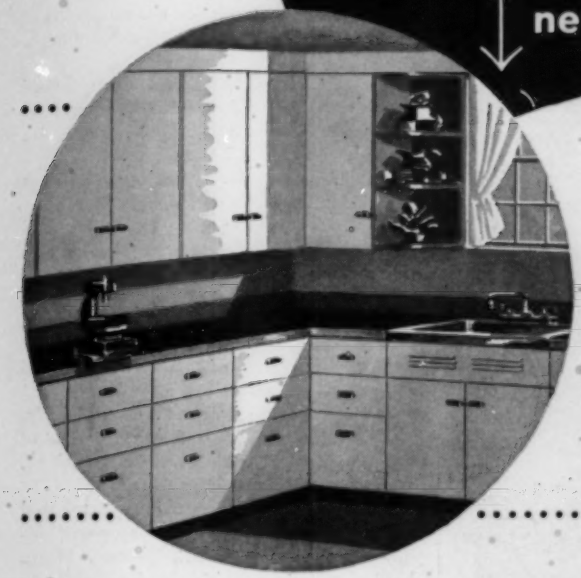
Gravell & Minick, Architects-Engineers, announce the opening of offices in their building at Front and Harris Streets, Harrisburg, Penn.

Louis P. Hatkoff, Architect, has re-

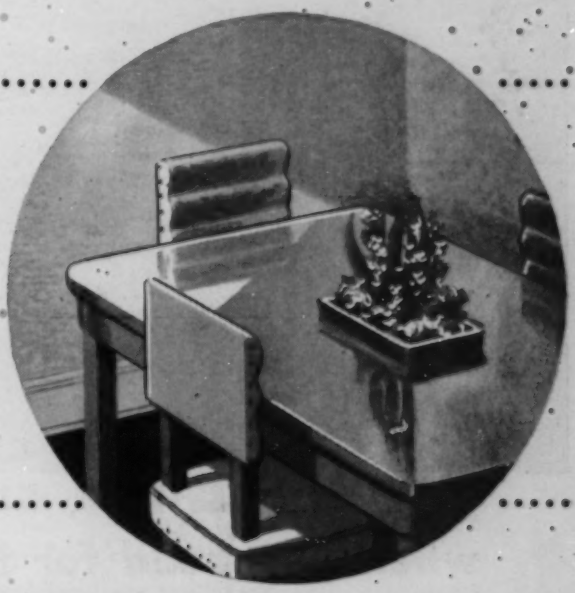
(*Continued on page 150*)

Kimpreg* + Plywood

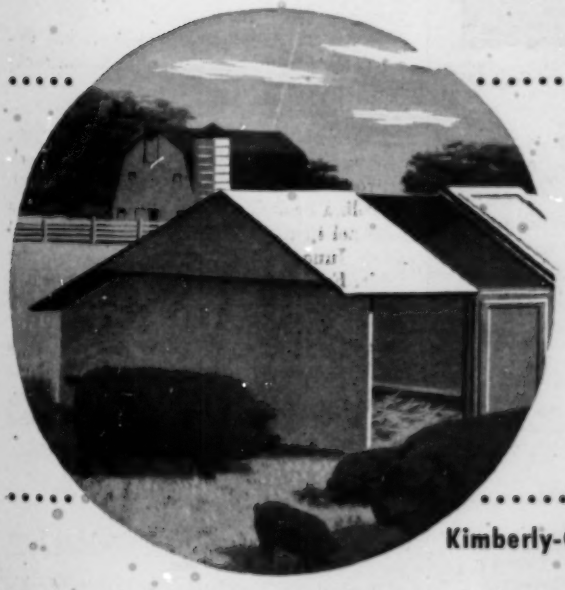
produces this amazing new material



LIGHT; STRONG—By fusing war-born Kimpreg Plastic Surfacing to plywood, a marvelous material is achieved. Here is an alloy that combines the character of plastic with the qualities of plywood. This rigid material is light in weight, high in strength and readily workable by ordinary plywood techniques.



STAINPROOF; SCUFFPROOF—With the durable surface of plastic, Kimpreg is ideal for a myriad of uses, from table tops to bus floors. Highly resistant to chemical action, this new material withstands weak organic acids, alkalies or common solvents. It will not scuff or stain.



WEATHERPROOF—Used to line refrigerator cars and for surfacing overseas shipping cases, Kimpreg Plastic Surfacing has proved its low vapor permeability and waterproof quality under extreme conditions. For complete information about Kimpreg Plastic Surfacing, mail coupon today.

Kimberly-Clark Corp., Neenah, Wis. Please send me free booklet and names of manufacturers making plywood surfaced with Kimpreg.
AR 346

Name .....

Firm .....

Type of Business .....

Address .....

City ..... State .....

*TRADE MARK

Kimpreg
REG. U.S. PAT. OFF.
PLASTIC SURFACING

A PRODUCT OF Kimberly Clark RESEARCH

opened his office at 356 W. 22nd St., New York, N. Y., following his discharge from the Army.

Harold Stuart Jones, A.I.A., and James M. Hunter, A.I.A., announce the return of Lt. Hunter from service with the Navy and the reopening of their offices at 2049 Broadway, Boulder, Colo., under the firm name of Jones & Hunter, Architects.

Kenneth Kassler has reopened his office for the practice of architecture in association with Louis T. Alexander and Raymond A. Bowers under the firm name of Kassler, Alexander, and Bowers, Architects. Address, 18 Nassau St., Princeton, N. J.

Howard Ketcham has reopened his industrial design, color and product research offices at 101 Park Ave., New York 17, N. Y., following his release from the Navy.

Henry A. Koch, Architect, and Dan W. Wood, Engineer, announce the opening of offices at 406 Chamber of Commerce Bldg., Denver 2, Colo. Mr. Koch has been associated with the Engineer Corps of the War Department for the past four and a half years.

Lt. Com. Paul E. Kohler, Jr., Architect, has reopened his office at 253 Worth Ave., Palm Beach, Fla.

Col. Samuel Lapham, (CAC), I.G.D., A.U.S., and Maj. Albert Simons, T.C., A.U.S., announce the resumption of the practice of architecture by the firm of Simon and Lapham, Architects, in its new offices, 209–210 Peoples Bldg., 18 Broad St., Charleston, S. C.

Gordon S. Marvel, A.I.A., recently returned from duty with the Corps of Engineers, A.U.S., announces the reopening of his office at 67 Second St., Newburgh, N. Y.

Jesse M. Page, Jr., A.I.A., has returned from active duty with the Seabees, and has reopened his office at 116½ W. Martin St., Raleigh, N. C.

M. D. Pearce, R.A., has opened offices at 219 Hodgson Ave., Houston, Penn.

Com. William Platt, U.S.N.R., and Maj. Geoffrey Platt, A.U.S., having been released from active duty, announce the reopening of the office of William and Geoffrey Platt, Architects, 101 Park Ave., New York 17, N. Y.

Charles N. Robinson, A.I.A., has opened offices at Lancaster, S. C.

Walter Sanders and Arthur Malsin, Architects, announce the establishment of an office at 465 Fifth Ave., New York 17, N. Y.

Benjamin S. Sheinwald, General and Consulting Architect, has reopened his offices at 85 South St., Boston, Mass., having terminated his services with the Building Construction Section of the National Advisory Committee for Aeronautics at Langley Field, Va.

Theodore L. Soontup, A.I.A., has reopened his offices devoted mainly to the specialized practice of hospital planning, design and construction. Address, 369 Lexington Ave., New York City, and 90-34 161st St., Jamaica, N. Y. Mr. Soontup was awarded the Bronze Star for his service as hospital architect with the Office of Chief Surgeon, E.T.O.

Willis L. Stephens, Architect, has opened an office at 1201 Kings Ave., Jacksonville 7, Fla.

Stork & Lyles, Architects, have reopened their offices at 1302 Main St., Columbia, S. C. During the war Mr. Stork served as Chief Architect for the South Carolina branch of the FHA. Mr. Lyles, a Colonel in the Corps of Engineers, served from June, 1942, to Nov., 1945, for the Chief Engineer, E.T.O., in charge of design of hospitals, camps, depots and similar installations.

John H. Truluck, Jr., Architect, has been discharged from the service and has returned to the practice of architecture, with offices in the Press and Standard Bldg., Walterboro, S. C.

New Addresses

The following new addresses have been announced:

Badgeley, Wood & Bradbury, Architects, 204 E. 39th St., New York 16, N. Y.

Morris Lapidus, Architect, 256 E. 49th St., New York, N. Y., effective about the end of April.

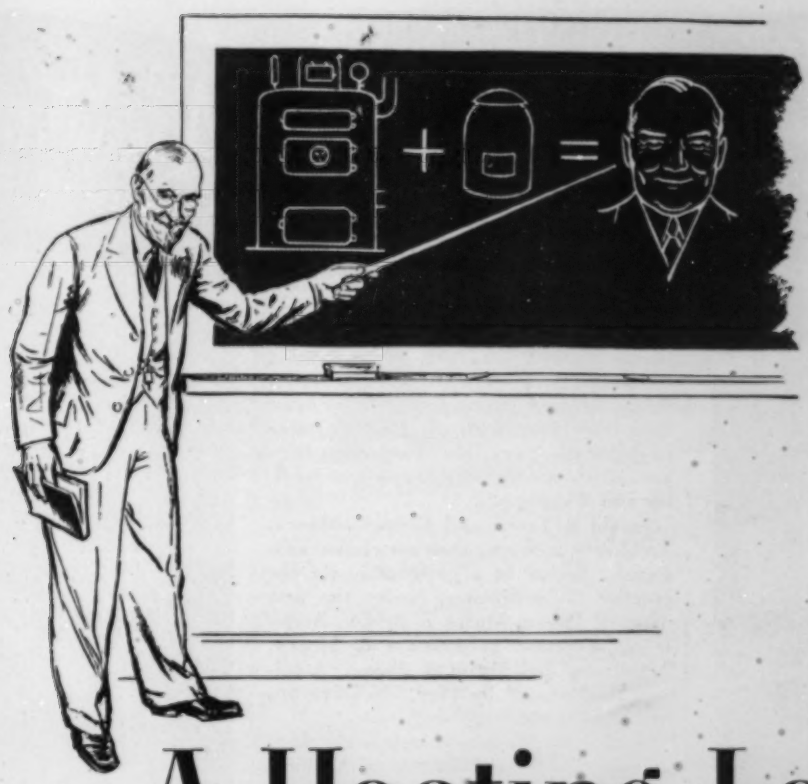
Washington Reed, Jr., Architect, "North Wales," Warrenton, Va.

(*Continued on page 152*)

WIRE FOR BUSINESS
when you build for BUSINESS

Wiremold Wiring Systems become a part of your overall design for functional efficiency in offices, stores, restaurants, theaters and other types of BUSINESS buildings. Because all such buildings require wiring systems that can be CHANGED to meet constantly changing needs...by extension, addition, relocation of outlets. Such buildings also require plug-in-anywhere convenience for appliances, machines and display, plus overfloor wiring facilities for telephone and power or light service to desks, etc. Only Wiremold with its complete interconnectability of 10 basic wiring systems gives you this needed modern flexibility in "adequate wiring today for the needs of tomorrow". See our catalog insert in your Sweet's File. Also feel free to write us for Engineering Data Sheets and help on your specific problems.

THE WIREMOLD COMPANY • HARTFORD 10, CONN



A Heating Lesson Well Learned

The fundamental rule of Comfortable Heating is Control—at all times, under all conditions, in all parts of the building.

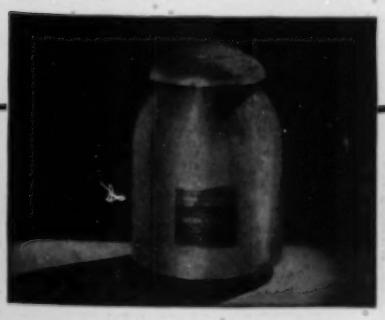
Many Building Owners have learned through tenant satisfaction that the Webster Moderator System of Steam Heating supplies heat when it is wanted, where it is wanted, in the amount necessary for comfort. No overheating. No underheating. No waste of fuel.

"Control-by-the-Weather" is provided by an Outdoor Thermostat which automatically adjusts delivery of steam to changes in outdoor temperature. The variator, a supplementary device, permits manual regulation when desired.

More Heat with Less Fuel

Seven out of ten large buildings in America (many less than ten years old) can get up to 33 per cent more heat out of the fuel consumed! . . . If you are planning on a new building or on modernizing an existing building, write today for "Performance Facts"—a book of case studies, *before* and *after* figures, on 268 Webster Steam Heating installations. Address Dept. AR-3.

WARREN WEBSTER & CO., Camden, N. J.
Pioneers of the Vacuum System of Steam Heating :: Est. 1888
Representatives in principal Cities. : : Darling Bros., Ltd., Montreal, Canada



The Webster Outdoor Thermostat, an element of the Webster Moderator System, automatically changes heating rate when outdoor temperature changes.

Fuel-Saving Starts With CONTROL

AUTOMATIC Webster *Heating Systems*

For Greater Efficiency in industrial plants

MONTGOMERY "Cross-Over" BRIDGES

Montgomery "Cross-Over" Bridges make possible faster handling and speeding up of production in all plants where loading docks are separated by railway tracks. This is equally true in either new construction or modernization projects.

These Bridges replace cumbersome drawbridges and transfer cars which delay traffic flow and waste many valuable minutes in hauling operations between buildings.

It takes only a minute to lower a "Cross-Over" Bridge after a freight train leaves a dock. The Bridge can be lifted — completely out of the way — in an equally short time. Available in any desired size at moderate cost.

The "Cross-Over" Bridge is a special development by Montgomery, whose elevator equipment is providing dependable, economical service in thousands of buildings.

Montgomery manufactures a complete line of passenger and freight elevators, electric dumbwaiters and special equipment for vertical transportation.

MONTGOMERY Elevator COMPANY

HOME OFFICE • Moline, Illinois

Branch Offices and Agents in Principal Cities

THE RECORD REPORTS

(*Continued from page 150*)

Milton B. Weissman, A.I.A., 164 Montague St., Brooklyn 2, N. Y.

New Firms

Alan Dailey, John W. Briggs and Roland A. Yaeger, all A.I.A., announce formation of the new architectural firm of Dailey, Briggs and Yaeger, with offices in the Hiram Sibley Bldg., 311 Alexander St., Rochester, N. Y. Both Mr. Dailey and Mr. Briggs are returning to practice after more than three years with the Civil Engineer Corps of the Navy. Mr. Yaeger has been associated recently with the firm of Kaelber and Waesdorp.

Ewald R. Froese and Albert C. Maack, Architects, announce their association with Rex L. Becker in a partnership for the practice of architecture under the firm name of Froese, Maack & Becker, Architects, successor to Johnson & Maack, Architects, and Baum & Froese, Architects. Address, Suite 1500, 705 Olive St., St. Louis 1, Mo.

Technical Planning Associates, Inc., announce their organization with offices at 30 Whitney Ave., New Haven, Conn. Members of the new firm are: Henry W. Buck, Hartford, industrial and sanitary engineer; Thomas H. Desmond, Simsbury, land architect and engineer; M. H. Lincoln, Hartford, architect; George C. Conway, Guilford, attorney; Peter P. Hale, New Haven, city planner; Lawrence Moore, New Haven, architect; Douglas Orr, New Haven, architect. The group was formed to get together the various interested professions in order to offer a collaborative service to municipalities. The services of the firm cover only the field of general planning; the Corporation will not engage in the practice of architecture, land architecture or engineering, which are practiced by its individual members.

J. Warren Wright and Arthur C. Metcalf, recently with the Armed Forces, announce the forming of a partnership for the practice of architecture under the name of J. Warren Wright, Arthur C. Metcalf, Architects, with offices at 106 Morgan Bldg., Bakersfield, Calif.

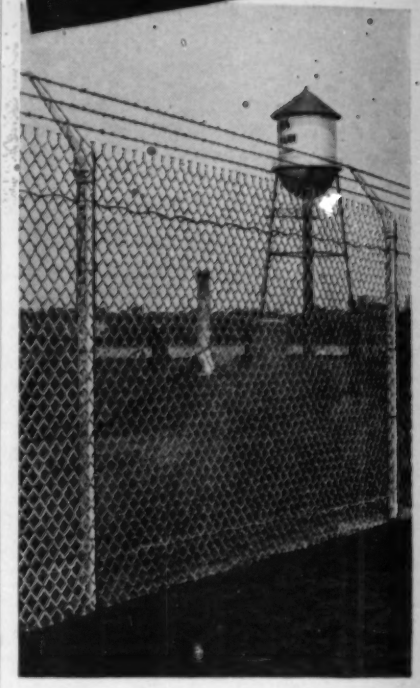
Aaron Colish and Charles G. Etter announce the formation of a partnership under the firm name of Colish & Etter, Architects, with offices in the Architects Bldg., Philadelphia 3, Penn.

Eric Mendelsohn, A.I.A., John Ekin Dinwiddie, A.I.A., and Albert Henry Hill announce formation of a partnership under the firm name of Mendelsohn, Dinwiddie and Hill, with offices at 233 Sansome St., San Francisco, Calif.

Allan S. Harrison, William F. R. Ballard and Frederick H. Allen, all of New York, announce formation of the firm of Harrison, Ballard & Allen, to function as owner's agents in the creation of multi-family housing developments and communities. Mr. Harrison, a civil engineer, was formerly New York City's Director of Public Housing. Mr. Ballard, an architect, formerly associated with Aymar Embury II,

(*Continued on page 154*)

4 BIG ADVANTAGES ---All Exclusive



4 Big Reasons for Specifying ANCHOR

Anchor Chain Link Fence has earned a top spot on the "spec" list of many architects because its rugged construction and exclusive design insure long life and maximum protection. Credit for this performance belongs to four big features . . . 1. *Deep-Driven Anchors*, which hold the fence permanently erect and in line, in any soil, in any weather, yet permit easy relocation where necessary . . . 2. *Square Frame Gates*, amazingly free from sagging and warping . . . 3. *U-Bar Line Posts*, rust-free and rigid . . . 4. *Square Terminal Posts*, which increase strength and durability.

Get This Book for A. I. A. File 14-K

"Anchor Protective Fences" is both a catalog and a specification manual. Shows many types and uses of Anchor Chain Link Fence . . . pictures installations for many prominent companies and institutions . . . contains structural diagrams and specification tables. Just ask for Book No. 110. You'll find it both useful and informative. We'll be glad to send you a free copy. Address: Anchor Post Fence Co., 6600 Eastern Ave., Baltimore 24, Md.

Anchor also makes a complete line of Anchor weld iron fences and gates. Send for Catalog 111 today.

Anchor Fence

Nation-wide Sales and Erecting Service

"The DEPENDABLE Line"

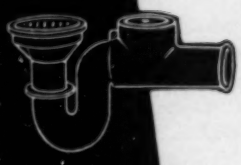
WADE

DRAINS AND PLUMBING SPECIALTIES

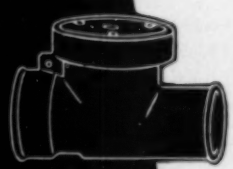
What is the most important single feature, comprising all features, that you expect in any product? We believe that your demands are for DEPENDABILITY. When you specify Wade, you benefit from over seventy-five years of:

1. **Dependable engineering**
2. **Dependable construction**
3. **Dependable performance**
4. **Dependable service**

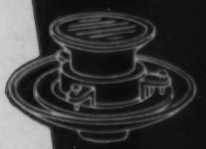
You can depend on getting more dollar value from the Wade line, too. Heavy, flawless bodies are cast in one of the world's largest, most modern foundries. Exclusive design features are a result of constant search for improvement by specialists with years of experience. Next-time you need plumbing drains or specialties, it will pay you to invest in Wade Dependability.



FLOOR DRAIN and TRAP W-2030



BACKWATER VALVE W-4200



FLOOR DRAIN W-1100

ROOF DRAIN W-3100

SEALED AIR CHAMBER

- **Floor Drains**
- **Roof Drains**
- **Backwater Valves**
- **Grease Interceptors**
- **Traps and Cleanouts**
- **Sealed Air Chambers**
- **Swimming Pool Drains and Equipment**

• A new condensed catalog describing and illustrating the whole Wade line is just off the press. Specifications you will want to have for present use or future reference are presented in handy, concise form. A request on your letterhead will bring you one without obligation.

WADE
MANUFACTURING COMPANY

DRAINS AND PLUMBING SPECIALTIES

ELGIN, ILLINOIS

Venus Drawing Pencils are engineered to give you drafting perfection without failure: accurately *graded* to assure uniformity in all 17 degrees... *strong* in performance... *smooth* and *clean* in action.

Put VENUS to the test on *your* drawing board. Send us a postcard or a note for two free samples. *Specify* degrees wanted.

VENUS

DRAWING PENCILS

American Lead Pencil Company, Hoboken, New Jersey

THE RECORD REPORTS

(*Continued from page 152*)

is a specialist in private house and large scale housing work; he was chief architect for a number of New York City Housing Authority projects, and in 1933 served as chief of the technical staff, Slum Clearance Committee of New York. Mr. Allen was deputy mortgage officer of the Bowery Savings Bank, New York.

Firm Changes

Holabird & Root, Architects, announce their departmental organization: Harry F. Manning, chief of drafting room; Walter B. Gray, chief, structural and civil engineering; William Cohen, chief, cost analysis; Norman E. Bueter, chief, mechanical engineering; Arthur G. Scout, air conditioning; Thomas F. Lavaty, plumbing and heating; Edward J. Wolff, chief, electrical engineering; Leon E. Schell and Henry J. B. Hoskins, specifications; John W. Brimsek, chief, business office.

F. Herbert Radey and Clarence L. MacNelly, Architects-Engineers, have combined the personnel of their organizations to render a more complete professional service to their clients in all phases of building research, design and supervision of construction. Address, 101 N. Seventh St., Camden, N. J.

The Office of E. B. Van Keuren, Architects and Engineers, announces that Charles F. Davis, Jr., who has been an associate for a number of years, has been accepted into partnership under the firm name and title of E. B. Van Keuren & Charles F. Davis, Jr., Architects & Engineers. Address, Martin Bldg., Birmingham, Ala.

Stanley Engineering Co., Muscatine, Iowa, announces that Marvin O. Kruse and H. Sidwell Smith have become partners in the firm.

Marjorie Hecht, until recently layout designer of flying boats and helicopters for Sikorsky Aircraft, has rejoined Robert Heller Associates, Inc., 2 W. 46th St., industrial designers, as interior design color specialist and assistant to Mr. Heller.

William J. Heiser, chief engineer of Lockwood Greene Engineers, Inc., has been elected a vice president of the company.

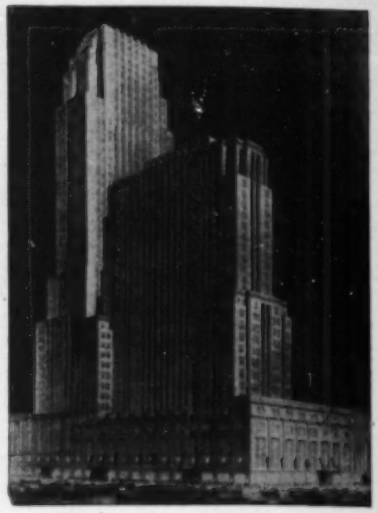
C. J. Palmgreen, A.I.A., Rody Patterson, A.I.A., and R. K. Fleming, Jr., A.I.A., announce the reorganization of their firm to Palmgreen, Patterson & Fleming, Architects, with offices at 429 Fourth Ave., Pittsburgh 19, Penn.

DeWitt Grow has been made a junior partner in the firm of Britsch & Munger, Architects, 531 Nicholas Bldg., Toledo 4, Ohio.

Dymaxion Dwelling Machines, Inc., has announced change of the company name to Fuller Houses, Inc., with new offices at 420 W. Douglas, Wichita 2, Kansas.

Charles F. Neergaard, consultant in hospital planning, organization and management, announces that Dr. Allan Craig and Louis B. McCagg, Jr., Architect, have become associated with him in his practice. Address, 41 E. 42nd St., New York 17, N. Y.

THE ENTRANCE OFTEN STAMPS THE CHARACTER OF THE BUILDING



An architecturally fine structure deserves imposing doors and entrances... as exemplified in Newman conceptions since 1882... ever-increasing in quality and artistic superiority to their glorious beauty in 1946.

NEWMAN

Hollow and Cast Bronze, Nickel, Aluminum and Stainless Steel

Pictured are the Netherland-Plaza Hotel and Carew Tower, Cincinnati, containing an extensive, complete installation of nickel silver, including many doors.

NEWMAN FEATURES:

HAND CRAFTSMANSHIP
QUALITY • • • SERVICE
REASONABLE PRICES

Bank Fixtures · Railings · Windows · Grilles · Gates · Store Windows · Directories · Letters

Write TODAY for file data, recommendations and estimates without obligation

NEWMAN BROTHERS, Inc.

"64 Years Young"

708 WEST 4TH ST., CINCINNATI 3, O.

NOW — Seventeen NEW *Balsam-Wool* data sheets!

• Yes—Balsam-Wool research is constantly at work to keep you up to date on insulation application. Today, there are seventeen *new* Balsam-Wool Data Sheets, bringing the entire series up to thirty-two. You'll want this series as a handy, authoritative guide to correct practice. Mail the coupon for your set—there's no cost or obligation.

Balsam-Wool

SEALED INSULATION

BALSAM-WOOL • *Products of Weyerhaeuser* • NU-WOOD

WOOD CONVERSION COMPANY
Dept. 115-3, First National Bank Building
St. Paul 1, Minnesota

Please send me a complete set of Application Data Sheets.

NAME.....

ADDRESS.....

CITY..... STATE.....